

**PEDTR 2019****18<sup>th</sup> International Scientific Conference “Problems of Enterprise Development:  
Theory and Practice”****DIGITALIZATION OF THE RUSSIAN ECONOMY IN THE  
CONTEXT OF GLOBAL TRENDS**

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***Abstract***

The article reveals the influence of digitalization and informatization on the transformation of the social structure, including the transformation of the labour market. Moreover, the article takes a closer look at the conditions and consequences of the "digital gap" and "digital inequality" appearance, which is also seen as a result of generational and regional differences that affect the availability of Internet resources to meet different user needs. Special attention is paid to the evaluation of the impact of modern key digitalization factors on the state and structure of both global and national labour markets, which, first of all, include a constantly growing level of production automatization based on the use of information and communication technologies and the level of robotic technologies and equipment application to industries and services. The influence of digitalization on the structure of different branch markets, which have been forming for many decades, is also noted, as the active use of ICT tools in practice determines the level of competitiveness of the markets' participants. The achieved level of digitalization defines the growth prospects of companies, market sectors and national economies in general: leading companies, while becoming serious digital players, have already changed the face of such spheres as tourism, telecommunications, trade, passenger and cargo transportation. According to the results of the analysis carried out in the article, it can be concluded that not all the regions and enterprises of the Russian Federation are fully using the possibilities of information technologies for a number of reasons.

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**Keywords:** Informatization, digitalization, social structure, labour market.

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## 1. Introduction

The processes of digitalization and informatization significantly change the global trends of social development: a knowledge economy, computerization of production, public relations virtualization are appearing. In its turn, the development of the knowledge economy and the processes that accompany the widespread implementation of digital technologies may be considered as harbingers of the inevitable transformation of all the sectors of the economy without any exception (Frank et al., 2019). Digitalization transforms the social structure, forming (and simultaneously eliminating) new social and professional groups, as well as it creates new conditions for the formation of digital segmentation and digital inequality. Digital segmentation also occurs on the labour market: social and psychological characteristics of employees (including those of age and region) determine their demand in digital economy.

According to that majority of experts, an important result of what is happening now will be an unprecedented in its scale transformation of the labour market. Among the main directions of this process stand the following:

1. A decline in the production sector, accompanied by an increase in employment in services;
2. An activation of globalization processes and the spread of freelancing;
3. Significant adjustment of qualification requirements for the majority of 'traditional' professions;
4. A noticeable reduction or complete extinction of some of the "traditional" professions, accompanied by the appearance of the new ones.

The topic of influence of the modern key factors of digitalization on the state and structure of both global and national labour markets deserves a special consideration. These include, above all, a constantly growing level of production automatization based on the use of ICT and the level of robotic technologies and equipment application in sectors of industry and services.

## 2. Problem Statement

Data obtained from the research conducted by the "McKinsey Global Institute" and the Organization for Economic Cooperation and Development (OECD) indicates that the current pace of automatization and robotization, in case of being maintained for the next 10 years, will make more than 240 million people around the world take on a new specialty or join a different professional group by 2030. According to experts of the International Federation of robotics, Japan stands on one of the leading positions in the world ranking of automatization and robotization. It is noted that more than 540 thousand robots are already being operated there. Similar success has been achieved by the EU countries, which possess 380 thousand robots in operation. Russia's success looks much more modest - 5 thousand robots. In 2015, scientists from the University of Oxford (USA) and the Nomura Institute (Japan) conducted a study on the modern problems of robotization. The results show that in the next 10-20 years, robots will be able to perform at least 40 % of work that people perform today without using modern ICT (235 out of 601 types of tasks) (McKinsey, 2017).

The report "Robots and industrialization in developing countries" published by the UN expressed the opinion supported by the expert community, according to which the maximum losses from the automatization and robotization processes will be suffered by developing countries. Thus, it was noted that

up to 70% of the workforce may face dismissal. Developed countries should not worry about this: professions that could have been affected have already disappeared, or the process of their vanishing is coming to an end. However, significant and undeniable advances in digital technology in developed countries have a strong impact on the structural changes, associated with the appearance of new digital professions, that are taking place in the national and global labour markets (UNCTAD, 2016).

### 3. Research Questions

The Internet "... promises to provide the access to inaccessible pinnacles of power and previously unattainable streams of information for underprivileged groups of population" (Gering, 2006, p.12), creates an illusion of digital equality, because the information is in the public domain and can be used by anyone willing. So why is this only an illusion of equality?

Firstly, the question of access to informational resources arises. We are talking primarily about technical availability – the access to computer, network connection, etc. And this technical availability is not equal among the residents of different regions and different levels of welfare. According to Yandex (Rusability, 2016), Internet penetration to different federal districts of the Russian Federation is uneven: the leaders are Moscow and Saint Petersburg (the share of those going online at least once a month is 77%), and the outsider is Far Eastern federal district (the share of those going online at least once a month is 64%). The average rate for Russia is 67%. As we can see, on the average, one third of the Russian population do not access the Internet even once a month, and, consequently, is cut from the information allocated there, so as a result ‘digital inequality’ occurs.

However, the access to informational resources is not only technical, "... but also implies the skills and abilities that make it possible to use it effectively. Access means a comprehensive mechanism for searching and finding" (Gering, 2006, p.32). It is obvious that these skills also differ among various categories of population, and, therefore, may create the basis for social segmentation, including regional, due to the differences in the levels of digital literacy, which is considered as "...a set of knowledge and skills that are necessary for safe and effective use of digital technologies and Internet resources" (Digital Literacy, 2018, p.3).

Digital literacy index distribution in the federal districts of the Russian Federation in 2018 (Digital Literacy, 2018):

1. Central federal district – 6,70;
2. Northwestern federal district – 6,0;
3. Ural federal district– 5,08;
4. Siberian federal district – 6,01;
5. Volga federal district – 4,50;
6. North Caucasian federal district – 2,81;
7. Southern federal district – 3,31;
8. Far Eastern federal district – 5,20.

Secondly, the formation of digital inequality is influenced by a factor of the work of search engines, which can be adjusted by the owners of the resources in accordance with certain principles, by accumulating or, on the contrary, leveling any information. Consequently, the power resource for the accumulation and

distribution of information is uneven, especially since " ... many search engines are initially biased. Some of them are commercial enterprises, and websites are obliged to pay in order to be included in the database" (Gering, 2006, p.45).

Thirdly, Internet search is aimed at meeting the interests of a particular user by selecting and segmenting information based on previous search queries (with the help of targeting). But this adjustment can lead to social stratification as communities, largely or completely isolated from others, appear. Indeed, the world is what we know about it, and if information about the world is segmented, society breaks up into many communities united by narrow interests and unaware of the interests and needs of other communities (or unwilling to consider them). As a result, polarization in opinions, preferences, values, occurs. A phenomenon of so-called "cyber-balkanization" appears, meaning that "...the Internet allows you to use even slight preferences of people to form homogenous subgroups, the interaction within which is much wider than communication between the groups" (Gering, 2006, p.92).

#### **4. Purpose of the Study**

The purpose of the study is to identify trends in the Russian labour market transformation in conditions of digital economy: the influence of automatization and robotization processes on the possible significant reduction of working time that a person will spend at his workplace; changes in production factors demand, etc. It is necessary to conduct an analysis of the effectiveness level of digital technologies implementation and application among different economic sectors in the Russian Federation. As a result of the study, the "digital gap" between different regions of the Russian Federation is evaluated.

#### **5. Research Methods**

The research methodology is represented by a combination of systematic and situational approaches. This allows us to assess digitalization in the context of the Russian economy development in specific regions and economic sectors. The article also provides a secondary analysis of research and statistical data on the digitalization of Russian economy and Russian labour market, in particular.

#### **6. Findings**

For a long time, experts have been actively discussing the impact of automatization and robotization on the possible reduction of the great amount of working time that a person will spend at their workplace. Thus, the head of "Alibaba Group" Jack Ma (Shortened working week-myth or reality?) expressed the opinion that by 2050 a working day will be reduced at least by half and will not exceed 4 hours thanks automatization (Balakrishnan & Gernon, 2017). Today, the possibility of switching to a 4-day working week is being discussed more and more actively. For example, since August of this year, in the Japanese office of "Microsoft" employees were allowed not to work on Fridays as a part of experiment. The conducted survey reveals that 92% of the interviewed employees were in favor of further continuation of the experiment, definitely considering it useful. The company's management noted a 40% increase in employees' productivity after the introduction of the four-day working week. During the experiment, a

decrease in the working time loss was recorded, due to an increase in communications between employees using online chats.

The digital economy has a major impact on the structure and content of branch markets that have been established for decades. The use of modern digital technologies accelerates the process of branch, regional and world markets globalization, significantly increases foreign trade operations, puts forward strict requirements for the need in improving transport infrastructure within international transport corridors (Golyschkova, Lobachyov, & Metyolkin, 2018).

Active use of information and communication technologies in practice (hereinafter-ICT) ensures the competitiveness of participants of branch and regional markets. The achieved digitalization level determines the growth prospects of companies, market segments and national economies in general. Leading companies, having become serious digital players, have already changed the face of such spheres as tourism, telecommunications, trade, passenger and cargo transportation, physical border protection, including state borders (Gartner, 2018; PWC, 2019).

Digitalization of economic sectors also leads to changes in production factors demand. Under the influence of digital technologies and new business models related to them, the transformation in both separate sectors, in the entire economic structure inter-sectoral interactions can be seen. Results of the research conducted by HSE experts (HSE, 2019), suggest that digitalization can significantly increase the factor productivity of both industrial sectors and services under favorable macroeconomic and institutional conditions: for instance, in the educational field, the additional contribution of individual growth factors to the added value of various sectors of the Russian economy as a result of digitalization processes (average annual values for the 2019-2030 period) is distributed as follows: productivity factor – 1.00; capital factor – 1.20; labour factor – 0.57; total – 2.77. It is interesting to note that the share of the labour factor in any of the sectors of the economy is not the leading one:

- Financial sector: productivity factor – 0,92; capital factor – 1,20; labour factor – 0,93
- Transport sector: productivity factor – 1,29; capital factor – 1,20; labour factor – 0,55
- Construction sector: productivity factor – 0,98; capital factor – 1,02; labour factor – 0,88

Moreover, in several sectors of the economy it even has a negative share (for instance, in chemical industry – «-0,43», in mechanical engineering - «-0,46», in light industry «-0,65»).

The greatest effect from the introduction and use of digital technologies in our country can be achieved in knowledge-intensive sectors of the services and in high-tech industries, the efficiency of which can increase faster than in other sectors of the economy. Digitalization will not only require an increase in investments into digital technologies, but also a radical modernization of the infrastructure of almost all economic sectors. According to HSE analysts, a steady increase in digitalization contribution of to GDP is expected in Russia (HSE, 2019).

For instance, experts predict the contribution of economic sectors digitalization to be fluctuating between 1.0% and 18.4% from 2017 to 2030; the contribution of the information industry - between 0.1% to 2.3%. As for assessing the overall prospects for digital technologies development and implementation in the Russian Federation, it should be noted that the current state is reasonable optimistic, although the results of international comparison on key indicators demonstrate that the Russian Federation does not occupy a leading position in the world. Thus, according to the World Economic Forum rating, in 2018 Russia ranked

only 43rd among 140 countries based on the level of the global competitiveness index. At the same time, according to the level of the "Penetration of information and communication technologies" sub-index in the world ranking, Russia occupies the 25th place. This ranking has been reached thanks to a significant share of mobile phone users among the population (11th place in the world ranking) and the wide spread of fiber-optic Internet (12th place in the world ranking). According to other parameters involved in the calculation of sub-index, Russia significantly lags behind the world leaders: by the number of fixed broadband Internet subscribers per 100 people Russia ranks 46th in the world; by the proportion of Internet users among the population – 49th; by the number of mobile Internet subscribers per 100 people - 51st (UNESCO, 2017).

Data presented below describes the level of digital technologies penetration into the regions of the Russian Federation. The purpose of the analysis of the data presented in these tables is to find the so-called "digital gap" or inequality that exists between territorial entities in access to ICT. As a rule, such digital gap causes strengthening or weakening the economic position of the corresponding region, and the appearance or absence of the necessary opportunities for the economic, social and cultural strata convergence in the Russian Federation region. Different reasons may explain the ways by which people can Different digital technologies access and usage capabilities of the population may have different reasons. Uneven levels of socio-economic development of the regions; different economic opportunities of the population are the most important of mentioned reasons. It is important to understand that economic imparity is the basis of digital inequality. Different economic and, most importantly, financial capabilities of the population provide different opportunities not only for the access, but also for active use of modern digital technologies (Federal State Statistics Service, 2019). The number of broadband mobile Internet subscribers per 100 people across the regions is spread as follows:

- The Russian Federation: from 68.1 in 2015 to 86.2 in 2018
- Central federal district: from 79.2 in 2015 to 97.4 in 2018
- Northwestern federal district: from 71.8 in 2015 to 93.1 in 2018
- Southern federal district: from 61.9 in 2015 to 77.5 in 2018
- North Caucasian federal district: from 61.9 in 2015 to 67.9 in 2018
- Volga federal district: from 62.2 in 2015 to 81.1 in 2018
- Ural federal district: from 53.5 in 2015 to 85.4 in 2018
- Siberian federal district: from 66.6 in 2015 to 82.9 in 2018
- Far Eastern federal district: from 74.7 in 2015 to 86.7 in 2018

Data analysis allows us to make the following conclusions. The number of broadband mobile Internet subscribers is steadily growing throughout Russia. The Ural and Northwestern federal districts show an advanced development. The presented data show that the number of mobile Internet users in the Ural Federal district has increased by 31.9%, and in the Northwestern federal district - by 21.3% in comparison with 2015. The North Caucasian federal district (6.0%) is an outsider in terms of growth pace. A significant increase in the indicator is observed in the regions with an initially low indicator base.

Such a rapid development of broadband mobile Internet access may be explained by the active spread of modern mobile devices (smartphones and tablets); the introduction of tariff plans for the Internet services available to the main social groups of Russian regions.

The number of fixed broadband Internet subscribers per 100 people (Federal State Statistics Service, 2019) is spread as follows:

- The Russian Federation: from 18.3 in 2015 to 21.7 in 2018
- Central federal district: from 20.5 in 2015 to 26.0 in 2018
- Northwestern federal district: from 22.3 in 2015 to 23.9 in 2018
- Southern federal district: from 13.8 in 2015 to 17.7 in 2018
- North Caucasian federal district: from 6.4 in 2015 to 8.6 in 2018
- Volga federal district: from 19.5 in 2015 to 22.0 in 2018
- Ural federal district: from 21.8 in 2015 to 24.6 in 2018
- Siberian federal district: from 17.8 in 2015 to 20.3 in 2018
- Far Eastern federal district: from 14.7 in 2015 to 17.5 in 2018

The results of the data analysis show an even and progressive increase in the number of fixed broadband Internet subscribers in the all regions of Russia. The most significant growth may be observed in the Central federal district. In comparison with 2015, this indicator has increased by 5.5%. The minimum increase has been reached in the Northwestern federal district (1.6%). At the same time, this district gained the highest value of the analyzed indicator in 2015. Thus, the district cannot be considered an outsider, as during the analyzed period, it continued to develop systematically within the framework of the corresponding indicator. The main fields in using broadband Internet access by the Russian population are the following:

- Geolocation services;
- Access to public services;
- Banking services;
- Access to informational and educational portals and resources;
- Access to news aggregators and electronic media;
- E-Commerce, access to services aggregators (entertainment, tourism, taxi, food, etc.);
- Access to social networks and messengers.

A rather small number of fixed broadband Internet subscribers in Russia (21.7% by the end of 2018) can be explained by the regional "digital gap" (different technical capability to connect to the Internet, weak coverage of traditional means of communication, different opportunities of fiber-optic highways connection among the regions, etc.); high hookup costs and high tariffs for the services.

The share of organizations using the Internet among the regions of the Russian Federation, % of the total number of organizations in the corresponding Russian region is the following (Federal State Statistics Service, 2019):

- The Russian Federation: from 88,1 in 2015 to 91,1 in 2018
- Central federal district: from 90,8 in 2015 to 93,4 in 2018
- Northwestern federal district: from 92,4 in 2015 to 92,8 in 2018
- Southern federal district: from 82,9 in 2015 to 91,6 in 2018
- North Caucasian federal district: from 89,0 in 2015 to 83,9 in 2018
- Volga federal district: from 87,2 in 2015 to 91,2 in 2018
- Ural federal district: from 89,1 in 2015 to 90,9 in 2018

- Siberian federal district: from 85,3 in 2015 to 88, in 2018
- Far Eastern federal district: from 88,0 in 2015 to 89,4 in 2018

The share of organizations using personal computers among the regions of the Russian Federation, % of the total number of organizations in the corresponding Russian region is the following (Federal State Statistics Service, 2019):

- The Russian Federation: from 92,3 in 2015 to 94,0 in 2018
- Central federal district: from 95,0 in 2015 to 95,8 in 2018
- Northwestern federal district: from 95,1 in 2015 to 95,4 in 2018
- Southern federal district: from 86,5 in 2015 to 93, in 2018
- North Caucasian federal district: from 94,6 in 2015 to 86,7 in 2018
- Volga federal district: from 91,2 in 2015 to 94,3 in 2018
- Ural federal district: from 93,3 in 2015 to 94,1 in 2018
- Siberian federal district: from 90,4 in 2015 to 91,9 in 2018
- Far Eastern federal district: from 93,7 in 2015 to 94,5 in 2018

Data analysis reflected allows us to make the following conclusions. During the analyzed period, a steady increase in the number of organizations using the Internet in their daily activities can be noted in all the districts of the Russian Federation, except for the North Caucasian Federal district (-5.1%). The mentioned district has also faced a decrease in the proportion of organizations that use personal computers in their professional activity (-7.9%). The Southern federal district is an undisputed leader in increasing the usage of ICT by the companies and organizations located on the territory of the district. During the analyzed period, the number of organizations using the Internet has increased by 8.7%, the proportion of those using personal computers - by 7.0%.

The results of the analysis indicate a fairly high level of the ICT tools usage among domestic companies. Today, only 6% of companies do not use personal computers in their professional activities (according to the end of 2018 data). A slightly larger proportion (8.9%) of organizations do not use or are not able to use the services provided by the global Internet. At the same time, the main fields of digital technologies application by domestic companies continue to be:

- Gaining access to background and regulatory information;
- Collecting, processing and storing internal regulatory, background and operational information;
- Access to and provision of remote financial and banking services;
- Information exchange with state, regional and municipal authorities, including statistic reports;
- Providing information exchange and communication within the framework of business processes;
- Personnel selection for vacant positions;
- E-mail services;
- Internal corporate networks.

## 7. Conclusion

The results obtained in the investigation process of the digital technologies penetration level into the regions of the Russian Federation, and the analysis of the main fields of their application by domestic companies, indicate that not all the regions and enterprises of the Russian Federation fully use the

capabilities of these technologies. The main reasons for the management refusal to develop and further employ corporate informational networks, as one of the most effective digital technologies applications, are the following:

- High volume of additional investments required for the creation, implementation and operation of the corporate informational system;
- Significant economic damage that the company may suffer in case of non-professional design and operation of the corporate informational system;
- Lack of specialists that can assist the management team in choosing a suitable system or in developing corporate informational system of its own that will best meet the needs and will consider organizational peculiarities and capabilities (Svistunov, Kuzina, & Lobachev, 2019);
- The absence of standard design solutions that do not require any significant changes or adjustments while being used in the corporate informational system creation.

A special management body - the Supervisory Board of the "Digital economy" organization has been created in order to successfully implement the projects within the framework of the National program "Digital economy". On June 27, 2019, the first Council meeting was held in Moscow, where the decision to create special groups working on digital industry, digital education and digital healthcare was approved.

In accordance with the purpose of each working group, the regulations on their functionality were approved, work plans were formed, and the group membership was determined. While forming groups, preference was given to the most competent representatives of the business, that were able to give a professional expert opinion on the state of digital technologies usage within a particular market segment and that were also capable of formulating specific suggestions on making the necessary changes and adjustments in the digitalization processes of the market segments.

In his speech at the Council meeting, General Director of the "Digital economy" (Digital Economy, 2019) organization noted that the success of digital transformation requires a dialogue between representatives of the state and the market segments' communities, referring to the synchronization of governmental and business views on the solution to the problems of the prioritized economic sectors and social digital transformation. According to the expert, that will allow us to develop optimal approaches to digitalization.

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