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LABOR MARKET TRANSFORMATION IN THE CONTEXT OF DIGITAL TRANSFORMATIONS OF THE ECONOMY

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ABSTRACT

Objective: The research goal of the study is to establish the socioeconomic advantages and threats associated with the transformation of the labor market in the context of digital transformations of the Russian economy.

Methods: The authors evaluate the digitalization of the Russian economy on a global level, comparing information from the World Bank, the Fletcher School, and Euromonitor International, and analyze socioeconomic changes in the labor market using empirical observation.

Results: The analysis concludes that the Russian economy is experiencing a labor market transformation similar to developed digital states, yet faces a decline in the working population and human capital flight due to migration.

Keywords: Labor market; Digital transformation; Digitalization of the economy; Employment relations system; Digital ecosystems; Job polarization.

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TRANSFORMAÇÃO DO MERCADO DE TRABALHO NO CONTEXTO DAS TRANSFORMAÇÕES DIGITAIS DA ECONOMIA

RESUMO

Objetivo: O objetivo da pesquisa é estabelecer as vantagens socioeconômicas e ameaças associadas à transformação do mercado de trabalho no contexto das transformações digitais da economia russa.

Métodos: Os autores avaliam a digitalização da economia russa em nível global, comparando informações do Banco Mundial, da Escola Fletcher e da Euromonitor International, e analisam as mudanças socioeconômicas no mercado de trabalho usando observação empírica.

Resultados: A análise conclui que a economia russa está passando por uma transformação do mercado de trabalho semelhante aos estados digitais desenvolvidos, mas enfrenta um declínio na população ativa e fuga de capital humano devido à migração.

Palavras-chave: Mercado de trabalho; Transformação digital; Digitalização da economia; Sistema de relações de emprego; Ecossistemas digitais; Polarização de empregos.

INTRODUCTION

The main vector of the modern economy is its transition from the industrial to post-industrial era, which implies an explosive development of digitalization. Digital transformation affects virtually all spheres of economic activity. E.T. Shafieva and R.R. Gedugoshev (2021) note that "at present, it is not only enterprises that actively take advantage of digitalization, it is utilized by entire industries, since it is the only way to be competitive in the rapidly changing external conditions" (p. 167).

The Fourth Industrial Revolution has given rise to major infrastructural changes in the economy. The production sector is seeing a rapid change in technologies and employed business models. New industries emerge periodically, while several traditional industries are gradually dying out.

The central element in digitalization is the individual, their knowledge and competencies. Therefore, the digital transformation of the economy directly influences the labor market and the system of labor relations of economic entities. Increased use of digital technology in the financial and banking sectors has caused a significant drop

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in their demand for workforce, and the job functions of certain staff positions have been completely replaced by robots and software. Artificial intelligence has expanded opportunities for remote customer service and increased the speed and transparency of data processing. As pointed out by G.V. Semeko (2021), "banks implement biometric technologies in the front office to identify customers and mimic live employees with chatbots and voice assistants" (p. 84). The advancement of e-commerce entails a decrease in demand for offline store employees. In production, the automation of production processes removes the need for assemblers and conveyor belt workers.

In an investigation of the social threats brought about by the transformation of the labor market due to the development of the digital economy, A.A. Khachaturian (2021) stresses that "further digital transformation of the economy will endanger more and more jobs, not necessarily providing a comparable emergence of new ones. However, unlike in previous times, when workers freed by automation had a chance to find a new job in a similar industry, now their layoffs will almost always be permanent" (p. 105). For this reason, structural unemployment will probably rise in the near future due to the imbalance of labor force qualifications.

The problem of skill development in the context of digital transformation has been researched by L.A. Petrova and T.E. Kuznetsova (2020), who argue that "amid the growing digitalization of the economy, the basic competencies in demand are changing because an increasing number of functions require technical skills. … All across the world, the number of jobs that require competencies in the sphere of artificial intelligence is rising" (p. 83). In this connection, the current requirements of the modern labor market for potential employees include digital skills, creativity, and the ability to learn continuously and raise the level of their qualifications.

The impact of digitalization on the transformation of the labor market was especially noticeable during the COVID-19 pandemic. Quarantine restrictions led to a wide spread of remote employment and the emergence of online professions. In this regard, M.F. Mizintseva and A.R. Sardanian (2021) stress that "the activization of 'digital' professions opens up great opportunities for residents of low-wage regions, including rural areas, and persons with disabilities" (p. 105).

Our literature review shows that transformations in the labor market caused by the digitalization of the economy are multifaceted, so some issues remain to be

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studied. This includes the effect of the structural reorganization of the economy on the labor market and the social threats emerging with the development of the digital economy.

Our paper presents an analysis of the level of digitalization of the Russian economy, examines trends in the size and structure of the Russian population, and establishes the advantages and problems connected with the digital transformation of the Russian labor market. Furthermore, the study offers proposals for reducing the socioeconomic challenges formed by transformations in the labor market amid the development of Russia's digital economy in the near future.

The goal of the study is to determine the socioeconomic advantages and challenges associated with transformations of the labor market in the context of the digital transformation of the Russian economy.

Research objectives:

- to assess the position of Russia by the level of digitalization of the economy compared to other countries;

- to analyze the socioeconomic trends and issues that emerged in the labor market in the course of the digitalization of the Russian economy;

- to develop proposals for reducing the socioeconomic challenges resulting from the transformation of the labor market due to the development of the digital economy in Russia.

MATERIALS AND METHODS

Assessment of Russia's position relative to other countries by the level of digitalization of the economy was carried out by comparing the data provided by the World Bank (Bjerde & Demirgüç-Kunt, 2021), the Fletcher School at Tufts University (Digital Planet, 2022), and Euromonitor International Ltd (2023). The socioeconomic trends and issues experienced by the Russian labor market in connection with the digitalization of the economy were analyzed using empirical observation based on the collection and analysis of statistical information characterizing this market. The required information was obtained from official statistics by Rosstat for 2020-2022. The choice of this observation period owes to the fact that at that time, the Russian labor market was intensely affected by a set of global factors, including the digitalization of the economy, the COVID-19 pandemic, and sanctions imposed by several states. The

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use of the systemic approach enabled us to develop key proposals that contribute to decreasing the socioeconomic challenges resulting from the transformation of the labor market amid the development of the digital economy in Russia for the near future.

RESULTS

The digitalization of the economies of developed and developing countries began in the early 2000s but reached its peak in the early 2020s. Paradoxically, this peak was associated with the advent of the COVID-19 pandemic. Many researchers are convinced that external shock crises can transform the economy along with its institutions and values (Auzan, 2022). The pandemic that started in 2019 sharply depreciated assets such as tourism, air travel, rental of vehicles for travel, etc. but simultaneously boosted the development of logistics and the digital industry. During the pandemic, society had a vital need for interaction despite isolation. By virtue of digital services and platforms, there turned out to be plenty of means of such interaction. In this period, social capital went through a qualitative reconfiguration, which influenced further structural transformations in the labor market and changes in the quality of public institutions. Digitalization, which until then was considered an auxiliary tool in economic and social processes, became a defining factor in people's daily lives and to a certain extent came to be a universally recognized institutional tool for citizens to trust each other when performing various actions in the digital environment. A.A. Auzan (2022) argues that digitalization has become a special type of public institution with a specific enforcement mechanism based on AI. This refers to digital platforms with data aggregators and ratings decided directly by users. These platforms became a key to the proliferation of distributed trust. Using platforms such as AirBnB, BlaBlaCar, Avito, etc., an economic subject communicates with strangers and makes transactions while being positive that it is safe. The subject believes that the aggregator or platform is operating correctly and that the rating of counterparties is fair because they participated in the compilation of the rating themselves.

At present, there is a wide variety of expert and rating estimations of the level of digitalization of world economies. These estimates are made using different methods of assessment and criteria. So far, there is no single and universally recognized method of judging the digital leadership of a particular country. It is safe to say, however, that several different ratings (the World Bank, Euromonitor, the Digital

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Planet research project, the Fletcher School at Tufts University, etc.) deem the Russian economy to be one of the most promisingly developing economies. In the field of creating digital ecosystems for the general consumer, Russia is one of the global leaders along with the United States and China (Bjerde & Demirgüç-Kunt, 2021; Digital Planet, 2022; Euromonitor International Ltd, 2023). Today, the ecosystems of such large entities as Sber, Yandex, MTS, Tinkoff, and several others are absolute leaders in the Russian market for digital services.

The pandemic and post-pandemic periods gave rise to new trends in the development of digital technology in the contemporary Russian economy. This, in turn, has shifted the emphasis in the structure of the labor market and workforce. Demand for information technology specialists has increased significantly in the last three years, as the volume of digital services and technologies has been growing rapidly. This is evidenced by figures on the costs of creating and using digital technologies in various organizations by economic sectors (Table 1).

Table 1. Expenditures on the creation and use of digital technologies by economic sectors in Russia in 2020-2021, billion rubles

Sector	2020	2021	Increment, %
Information and communications	121.2	186.8	+54.1
Financial sector	192.7	175.3	-9.0
Research and development	51.1	95.0	+86.0
Information technology	54.3	87.0	+60.2
Wholesale and retail trade	58.4	79.6	+36.3
Manufacturing industry	74.5	78.1	+4.8
State and municipal management	75.4	69.3	-8.0
Real estate operations	16.8	45.7	+172.0
Transportation and storage	42.7	44.8	+5.0
Energy supply	19.4	30.5	+57.2
Mining operations	23.1	24.5	+6.0
Healthcare and social services	10.9	19.4	+78.0

Source: compiled by the authors based on (Abdrakhmanova et al., 2023).

The estimated costs of creating and using digital technologies show that the greatest development of these technologies is observed in the sectors of research and development, IT, information and communications, and, despite a relative decline of 9% in 2021, in the financial sector. Overall, the financial sector is the leader in terms of absolute investment in digital technologies and, above all, in mobile banking infrastructure. A considerable increase in the development and use of digital

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technologies is demonstrated by the medical field, real estate, and wholesale and retail trade. All of this comes as a result of the accelerated development of digital ecosystems that aggregate these operations.

The state is losing out to private businesses in the digital technology race due to its low mobility. However, there are trends towards the digitalization of public services and agencies at the state level, and they are being actively developed. The Gosuslugi service, the unified taxpayer's account, payment for ordinary consumers' services, and interaction with all representatives of natural monopolies are all the results of digital modernization in the public sector. Today, it is the government that has the highest demand for IT specialists in the labor market. Importantly, specialists in information and communications technologies and specialists dealing with intensive use of ICT are referred to the same category of specialists in different classifiers. However, this category has one distinctive feature. ICT specialists are understood as developers and analysts of software and applications, database and network specialists, electronics engineers, telecommunications engineers, and graphic designers. This category encompasses specialists who create information and communications products in the form of software, applications, databases, and other developments that can be considered a product of intellectual labor and innovative development. This group can be referred to as the active part of ICT professionals.

The second group is comprised of those who actively utilize ICT in their work. This typically includes virtually all professions where information technologies are used to store, transfer, and process data and perform user functions. This group can be considered the passive part of ICT specialists.

These two groups of workers will enjoy the highest demand in the labor market in the upcoming years. This is evidenced by the orientation of state policy in training personnel for the digital economy. Order of the Ministry of Finance of the Russian Federation dated November 18, 2020, No. 600, stipulates that the share of workers actively using ICT has to reach at least 25% by 2030. At the moment, the share of such specialists in the total number of employees in the economy is 10.2% (Abdrakhmanova et al., 2023). These prospects concern workers who are still largely engaged in the application of digital competencies. However, the Russian labor market is beginning to change structurally, and these changes largely apply to those areas and industries

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where active digitalization and automation are pushing several professions to extinction.

Back in 2016, economist C.B. Frey and machine learning expert M.A. Osborne conducted a study in which they ranked more than 700 professions by the risk of digitization and automation. The research shows that telephone sales, insurance appraisers, legal secretaries, waiters and hostesses, real estate agents, secretaries, and some other professions are the most prone to automation and digitalization. Occupations that are the least likely to go through digitalization in the near future are shipbuilders, archaeologists, computer systems analysts, psychologists, therapists, surgeons, and social workers (Frey & Osborne, 2017).

These trends are not exclusive to the Russian economy – these are global trends that unfold at different rates in different countries. With respect to Russia, however, there is one more trend characteristic of the labor market – the polarization of jobs. This is a process in which digitalization results in the market having the greatest demand only for the most high-skilled professions, i.e., those implying mastery of digital skills, and for the most low-skilled occupations, which do not require digital competencies, at least in the near future. Thus, polarization excludes medium-skilled workers, which are the category that suffers the most from digital transformation in the economy. They face the so-called "creative destruction" when external changes beyond their control force them to change their qualifications or raise them to meet the demands of the labor market and to get a better-paying job in the future. This category of workers includes a large part of the blue-collar and partly white-collar jobs.

In Russia, the aftermath of the economic crisis caused by the 2020-2021 pandemic was aggravated by a major crisis of 2022 associated with economic sanctions imposed by all developed countries. This crisis manifested itself in a sharp drop in production and international commodity turnover and a decline in wholesale and retail trade. Yet this crisis turned out to be atypical in terms of labor market transformation. Instead of the expected increase in unemployment, Russia, on the contrary, has a demand for a labor force of various qualifications. Official unemployment in the country in 2022 amounted to 3.7%, which is one of the lowest figures over a long period of time. The reasons for this state of affairs with employment lie in the nature of current demographic processes. First, for several years in a row, the Russian population has been shrinking both in total and the able-bodied segments.

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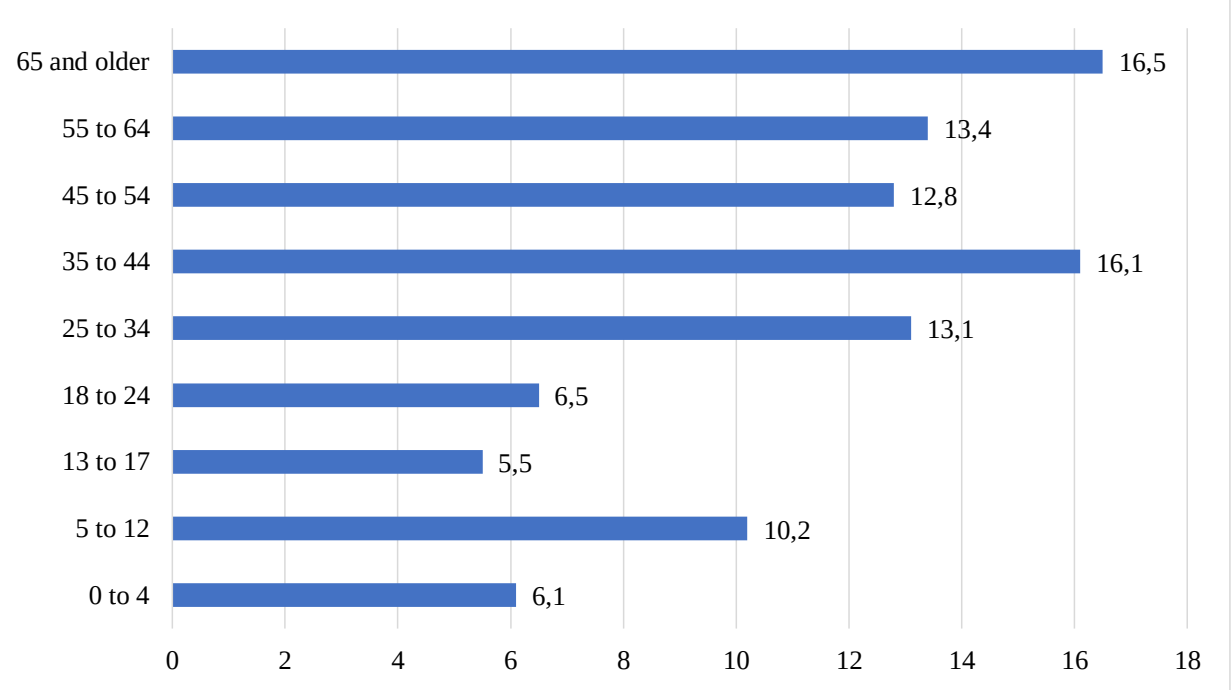
For example, in 2020, the country's population decreased by 582 thousand people with a natural loss of 689 thousand people. A small compensation for the loss of population was provided by migration growth. In 2021, natural population loss in Russia amounted to 1,040 thousand people, and migration growth reached 423 thousand people. In 2022, natural population loss totaled 600 thousand people, while migration growth was only 35 thousand people.

Second, the structure of age groups of the Russian population in 2022 suggests that people of retirement age (64 years old and above) leaving the labor market account for a much larger share than the younger generation (18 to 24 years old) entering the labor market (Figure 1).



Source: compiled by the authors based on (Federal State Statistics Service, 2022).

Figure 1. Structure of the population of Russia by age groups in 2022, percentages

As evidenced by the data, the two youngest working-age population groups in Russia collectively make up 10% less of the total population than the two oldest ones. This indicates that the labor market frees more people than enter it, which is the reason behind minimal unemployment rates. Furthermore, according to various estimates, in September 2022, around 600 to 1,200 thousand people of working age left Russia. The majority of these migrants belong to the age group most demanded in the labor market – between 25 and 34 years old. It is mainly workers in this age group that have valuable skills and competencies for the digital economy.

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DISCUSSION

The results of the study allow us to identify the trends in the Russian labor market that emerge under the influence of digital transformations of the economy, both those characteristic of other countries and those of a strictly national nature.

Experts at the World Economic Forum in their report "The Future of Jobs" conclude that in the near future, specialists in AI, machine learning, and Big Data will be in demand in Russia, while accountants, secretaries, and lawyers will be in surplus (World Economic Forum, 2020, pp. 99-100). This trend also applies to the global labor market. Experts predict that workers engaged in manual labor, such as repairmen, mechanics, and factory workers, may also be subject to retrenchment. We can only partly agree with these conclusions. On the one hand, the labor market is changing under the influence of technological innovations, because these novelties are maintained by people, which creates new jobs with part of the standard physical, intellectual, and routine tasks being removed by automation. Thus, the hardest blow is taken by white collars replaced by specialists who promote and maintain new technologies. This comes as a natural result of the industrial revolution. On the other hand, the digital and technological transformations taking place in the Russian economy facilitate the emergence of new jobs that require new qualities from applicants, including analytical thinking, stress resistance, creativity, ability to multitask, and ability to self-development. Therefore, workers who manage to adjust to the new conditions of the labor market with the help of the market for vocational education and retraining will stay in demand in their spheres. Our viewpoint is shared by researchers T.N. Gogoleva, E.S. Iurova, P.A. Kanapukhin, and L.M. Nikitina. They believe these conclusions of international experts contradict "the established belief that technological transformations in the economy lead to reduced demand for unskilled and low-skilled labor and increased demand for highly qualified labor, to a decrease in employment in traditional industries and its growth in new knowledge-intensive industries" (Gogoleva et al., 2022, p. 13).

The conclusion of the study that the Russian labor market demonstrates a trend of job polarization is valuable from the point of finding opportunities to realize human capital. This situation leaves middle-skilled workers unable to fully utilize their professional knowledge and skills due to the lack of suitable jobs. In this respect, we should agree with the position of V.N. Vasina and N.R. Kelchervskaia (2023) that job

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polarization leads to "the devaluation of investment in a range of occupations that involve manual and semi-automated work but require sufficient skills and engagement, which entails a decrease in the incomes and prosperity of the middle class" (p. 50). This point of view once again stresses the connection between processes taking place in the labor market and the living standards of the population in any country. Further research is required to obtain a more detailed characteristic of trends in the development of the Russian labor market under the influence of digitalization of the economy and the results of socioeconomic relations between employers and employees.

The conducted study shows that despite the development of digital transformations, Russia has a low unemployment rate. The multi-tiered nature of the Russian economy can be seen as a positive factor that slows this process down since it requires the use of labor of varying quality. We agree with the perspective on this phenomenon outlined by E.V. Maslova, O.A. Kolesnikova, and I.V. Okolelykh (2022). Within the foreseeable future, the existence of sectors at different technological levels will protect the Russian labor market from spikes in unemployment even in the context of the digitalization of the economy.

The analysis of the current situation in the Russian labor market highlighted problems in its supply with labor resources. The factors hampering this process are natural population decline, a decrease in migration growth, and migration of part of the economically active population to other countries. Considering the pressure of sanctions imposed by several countries, we can anticipate further redistribution of employment by economic sectors. Demand for labor will be generated by the fields required to provide resources for production and expansion of the import substitution program. These areas include enterprises in the field of information and communications, car repairs, and the manufacturing of machinery and equipment. In the long term, increased demand for labor can be expected from processing enterprises and educational and research organizations. However, this demand will be difficult to meet due to structural unemployment and staff deficits. This conclusion correlates with the findings of O.P. Chekmarev, A.L. Ilves, and P.A. Konev. The researchers argue that "opportunities to solve problems in the labor market in the next 2-5 years will depend on the ability of the state and the entrepreneurial community to organize retraining and create the conditions for staff to work within their new areas of

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expertise" (Chekmarev et al., 2022, p. 776). The time required to obtain new knowledge and practical experience will directly determine the resolution of the problem of structural unemployment and the development of the Russian economy.

Our findings, compared with other studies in this field, indicate that the prediction of future changes in the Russian labor market in the context of the digital transformation of the economy is a topical issue that should be developed further.

CONCLUSIONS

Under current conditions, the process of digitalization is irreversible and impacts the global economic system, transforming various sectors and the overall economic development of the state. Digitalization has turned from an auxiliary tool into a decisive factor in people's daily lives and, to some extent, a universally recognized institutional tool for citizens to trust each other when performing various actions in the digital environment. The central element in digitalization is the individual, their knowledge and competencies. Therefore, the digital transformation of the economy directly influences the labor market and the system of labor relations. Digitalization has shifted the emphasis in the structure of the labor market and workforce in Russia. Demand for IT specialists has increased significantly in the past three years, as the volume of digital services and technologies has been growing rapidly.

The Russian economy is seeing a transformation of the labor market in line with global scenarios characteristic of digitally developed countries. However, this situation is aggravated by a sharp decline in the working population due to natural population loss and a sharp reduction in the personnel resources needed for digitalization.

For the near future, the key areas that will contribute to the mitigation of socioeconomic difficulties caused by the transformation of the labor market in the development of the Russian digital economy should be:

- regulation of the irreversible processes of release, disappearance, and emergence of new professions and jobs in economic sectors;

- training qualified personnel who are skilled in digital technologies, have creative thinking, and can continuously learn and improve their qualifications;

- development of measures to minimize the negative consequences of job polarization in the Russian labor market and to support medium-skilled workers;

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- government support for low- and medium-skilled specialists, creation of special conditions for training ICT specialists.

The practical significance of the study lies in the identification of socioeconomic advantages and problems arising in the transformation of the labor market in the context of the digitalization of the Russian economy. Further research prospects within this topic are associated with an in-depth investigation of the problems of labor market transformation across the different regions of Russia.

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