



Assessment of the dynamics of the development of the Russian labor market under the influence of the use of information and communication technologies

Evaluación de la dinámica del desarrollo del mercado laboral Ruso bajo la influencia del uso de las tecnologías de la información y la comunicación

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ABSTRACT

The article presents an assessment of the dynamics of the development of the Russian labor market in general and its technological component in particular. The article provides an assessment of the effectiveness of measures taken by the Government to stabilize the situation on the labor market. The authors identified regional differences in the labor market, presented the grouping of the subjects of the Russian Federation by the level of employment. The analysis confirms the hypothesis that significant changes have taken place in the Russian Federation in the scale of the use of information and communication technologies by enterprises and organizations, which, according to the authors, are caused by the complication of the economic situation of enterprises and organizations in certain types of economic activity.

Keywords: cluster analysis, employment of the population, labor productivity, regression model.

RESUMEN

El artículo presenta una evaluación de la dinámica del desarrollo del mercado laboral ruso en general y su componente tecnológico en particular. El artículo proporciona una evaluación de la eficacia de las medidas adoptadas por el Gobierno para estabilizar la situación en el mercado laboral. Los autores identificaron diferencias regionales en el mercado laboral, presentaron la agrupación de los sujetos de la Federación Rusa por el nivel de empleo. El análisis confirma la hipótesis de que se han producido cambios significativos en la Federación de Rusia en la escala del uso de las tecnologías de la información y la comunicación por parte de las empresas y organizaciones, que, según los autores, se deben a la complicación de la situación económica de las empresas y organizaciones en determinados tipos de actividad económica.

Palabras claves: análisis de conglomerados, empleo de la población, productividad laboral, modelo de regresión.

1. INTRODUCTION

In connection with the active development and application of information and communication technologies in all spheres, American scientists introduced and widely used the concept of the digital

economy, which characterizes the advantages of the new economy over the old (Agrawal et al., 2015; Volini et al., 2020; Berg et al., 2018; Dumont, Istance, 2010).

Numerous studies show that the development of the digital economy in Russia determines significant changes in the labor market and employment of the population (Zemtsov, 2019; Kapelyushnikov, 2017; Mukhina, Sindyashkina, 2020). The problem of regulating employment and the labor market in modern conditions is the most relevant in the regional context, since a number of important socio-economic factors have a significant impact on the formation of the labor force (Simonova et al., 2016; Sankova, 2018; 2020). The digitalization of the Russian economy makes it necessary to adapt to the new conditions of the formation of the Russian labor market, which is an indicator of the socio-economic and demographic processes taking place in the country (Shirinkina, 2019).

As noted in the Strategy for the Development of the Information Society in the Russian Federation for 2017 - 2030, approved by the President of the Russian Federation in 2017, the digital economy is an economic activity in which digital data is a key production factor, processing large volumes and using the analysis results in comparison with traditional forms of management, they can significantly increase the efficiency of various types of production, technologies, equipment, storage, sale, delivery of goods and services (Dumont, Istance, 2010; Zemtsov, 2019; Decree of the President of the Russian Federation No. 203, 2017).

In July 2017 The Government of the Russian Federation has developed and approved a Program for the development of the digital economy until 2024, which defines the basic directions of digitalization of the economy: regulatory regulation, personnel and education, the formation of research competencies and technical reserves, information infrastructure and information security. As noted in the Program, it is necessary to "create conditions for the development of a knowledge society in the Russian Federation, improve the welfare and quality of life of citizens of our country by increasing the availability and quality of goods and services produced in the digital economy using modern digital technologies, increase awareness and digital literacy" (Government of the Russian Federation No. 1632-r, 2017).

2. METHODOLOGY

The analysis of existing trends in the labor sphere in individual federal districts and in the country as a whole was carried out using analytical indicators of time series of the labor force, employed and unemployed. With the help of the method of groupings, the division of the subjects of the Russian Federation by the level of employment and the level of unemployment was made.

In general, for the period under review, a structural analysis of the number of organizations by the specific weight of the number of employees who used personal computers at the end of the year, % of the total number of surveyed organizations, was carried out. Structural and dynamic analysis is applied to assess the use of information and communication technologies in organizations by main types of economic activity.

Using descriptive statistics methods, the number of information and communication technology specialists in organizations by type of economic activity in the Russian Federation in 2019 per 10 thousand employees of organizations was studied.

3. RESULTS AND DISCUSSION

It is legitimate to consider the labor market in the digital economy in several projections: technological, organizational, institutional, economic and socio-cultural. One of the most important trends of digitalization is the growth of employment in the field of ICT. In the EU countries, 8.2 million specialists

were employed in the field of ICT in 2016, which accounted for about 3.7% of total employment (Ministry of Economic Development..., 2020). In Russia in 2019, according to the Federal State Statistics Service (ROSSTAT), this indicator was 1.8% (The structure of the employed population..., 2021).

The number of labor force in the Russian Federation in 2020 decreased by 555.2 thousand people compared to 2010. (by 0.74%), amounting to 74922.7 thousand people according to the Federal State Statistics Service (ROSSTAT). It should be noted that during the period under review in 2011 and 2014-2015, there was an increase in the number of the workforce compared to previous years. In 2020, due to the spread of COVID-19, the number of workers decreased by 475.2 thousand people compared to the previous year (by 0.63%).

The number of people employed in the country in 2020 increased by 667.7 thousand people compared to 2010. (by 0.95%), reaching 70601.4 thousand people according to Rosstat. Due to the complication of the epidemiological situation in 2020, there was a reduction in the number of employed by 1331.7 thousand people. (by 1.85%).

The measures taken by the Government of the Russian Federation to stabilize the situation on the labor market contributed to a reduction in the number of unemployed in 2020 compared to 2010 by 1222.9 thousand people. (by 22.06%) to 4321.3 thousand people. But in 2020, there is a significant increase in the number of unemployed by 856.5 thousand people. (by 24.72%) (Figure 1).

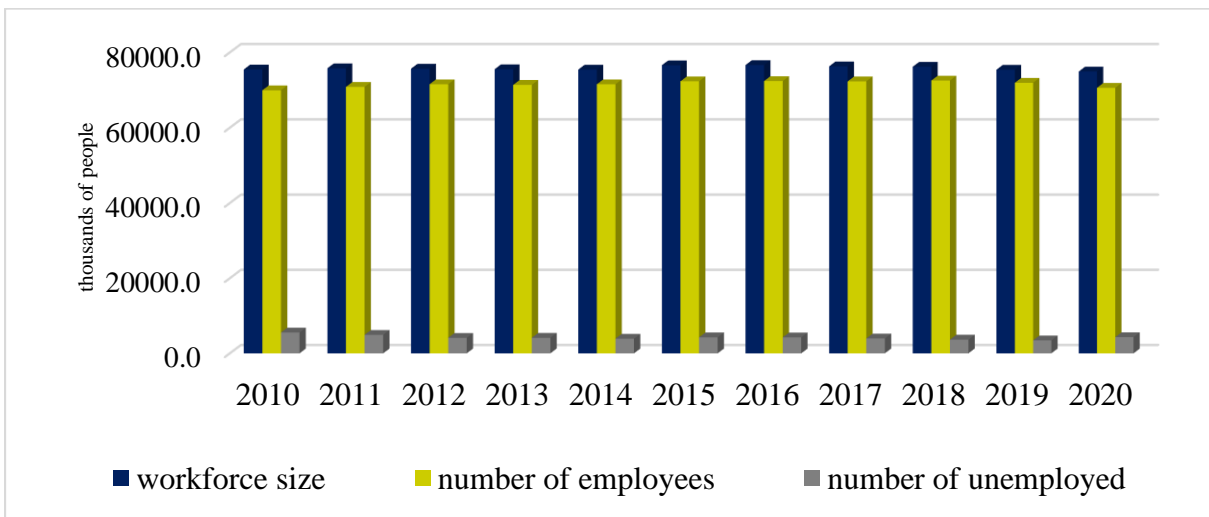


Figure 1. Dynamics of the number of labor force, employed and unemployed in the Russian Federation in 2010 - 2020, thousand people (Volini et al., 2020)

In the federal districts of the country, there is a multidirectional dynamic of the number of employed. In the Central, Southern and North Caucasian Federal Districts, their number is noted in 2020 compared to 2010. In the remaining federal districts, there was a decrease in the number of employed, which, in our opinion, is due to the outflow of the able-bodied population to other regions of the country. In all federal districts of the country, there is a decrease in the number of unemployed, and the most significant decrease in their number occurred in the Volga, Ural and Far Eastern Federal districts - by more than 30% (Table 1).

Table 1. Dynamics of the number of employed and unemployed in the federal districts of the Russian Federation

Federal district	Employed, thousand	Growth	Number of unemployed,	Growth
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	people		rate, %	thousand people		rate, %
	2010	2020		2010	2020	
Central	19716,3	20403,0	3,48	960,8	828,9	-13,73
Northwestern	7188,0	7064,9	-1,71	452,8	374,7	-17,25
Southern	6438,7	7662,9	19,01	529,7	498,9	-5,81
North Caucasian	3638,6	3889,1	6,88	718,9	625,6	-12,98
Privolzhsky	14664,5	13889,9	-5,28	1198,3	754,9	-37,00
Ural	6005,1	5938,5	-1,11	518,8	348,3	-32,86
Siberian	8243,1	7795,8	-5,43	761,6	615,7	-19,16
Far Eastern	4039,4	3957,3	-2,03	403,2	274,3	-31,97

The multidirectional dynamics of labor market indicators caused a change in the levels of labor force participation, employment and unemployment of the population. In the Russian Federation, the labor force participation rate decreased from 67.7% in 2010 to 62.0% in 2020, the employment rate - from 62.7% to 58.4% and unemployment - from 7.3% to 5.8%. A similar dynamic of the coefficients under consideration is observed in the regions of the country. In 2020 In the federal districts of the country, the labor force participation rate ranges from 59.3% in the North Caucasus Federal District to 64.4% in the Far Eastern Federal District, the employment rate ranges from 51.1% in the North Caucasus Federal District to 61.3% in the Northwestern Federal District.

There are regional differences in the level of employment in the subjects of the Russian Federation: the maximum value of the indicator is recorded in the Chukotka Autonomous Okrug – 76.2%, and the minimum value is in the Republic of North Ossetia-Alania (43.1%) (Table 2).

Table 2. Grouping of constituent entities of the Russian Federation by the level of employment in 2020, %

Level employment of the population, %	Federal District	Subjects of the Russian Federation
to 45,0	North Caucasian	Republic of North Ossetia -Alania
45,1 – 50,0	South	Republic of Adygea
	North Caucasian	Republic of Dagestan, Karachay-Cherkess Republic
	Uralsky	Kurgan region
	Siberian	Republic of Tyva
50,1 – 55,0	Central	Orel region, Ryazan region, Tambov region
	North-West	Republic of Karelia, Arkhangelsk Region, Leningrad Region, Novgorod Region, Pskov region
	South	Republic of Crimea, Volgograd region
	North Caucasian	Republic of Ingushetia, Chechen Republic
	Privolzhsky	Republic of Bashkortostan, Republic of Mari El, Penza region, Saratov region, Ulyanovsk region
	Siberian Far	Altai Republic, Republic of Khakassia, Altai Territory, Kemerovo Region
	Eastern	Republic of Buryatia
55,1 – 60,0	Central	Bryansk Region, Vladimir Region, Voronezh Region, Ivanovo Region, Kostroma Region, Kursk Region, Lipetsk Region, Smolensk Region, Tver Region, Tula Region, Yaroslavl Region
	Northwest	Komi Republic, Vologda Region, Kaliningrad region

	South	Republic of Kalmykia, Krasnodar Territory, Astrakhan region, Rostov region, Sevastopol
	North Caucasian	Kabardino-Balkarian Republic, Stavropol Territory
	Privolzhsky	Republic of Mordovia, Udmurt Republic, Chuvash Republic, Perm Krai, Kirov Region, Orenburg Region
	Uralsky	Sverdlovsk region
	Siberian Far	Krasnoyarsk Territory, Irkutsk region, Novosibirsk region, Omsk region, Tomsk region
	Eastern	Zabaikalsky Krai, Primorsky Krai, Amur Region, Jewish Autonomous Region
60,1 – 65,0	Central	Belgorod region, Kaluga region, Moscow region,
	Northwest	Murmansk region
	Privolzhsky	Republic of Tatarstan, Nizhny Novgorod region, Samara region
	Ural Far	Tyumen region, Chelyabinsk region
	Eastern	Republic of Sakha (Yakutia), Khabarovsk Krai,
65,1 – 70,0	Central	Moscow
	Northwest Far	St. Petersburg
	Eastern Far	Kamchatka Territory, Magadan region, Sakhalin region
70,1 and more	Eastern	Chukchi auth. district

In the context of the development of the digital economy, changes are taking place in the structure of employees using personal computers. In 2019, compared to 2010, the share of organizations in which 70 to 100 employees used personal computers in their activities increased from 44.0% to 46.3%. At that time, the share of organizations in which less than 10% of employees use personal computers decreased from 13.3% to 4.2% (Figure 2).

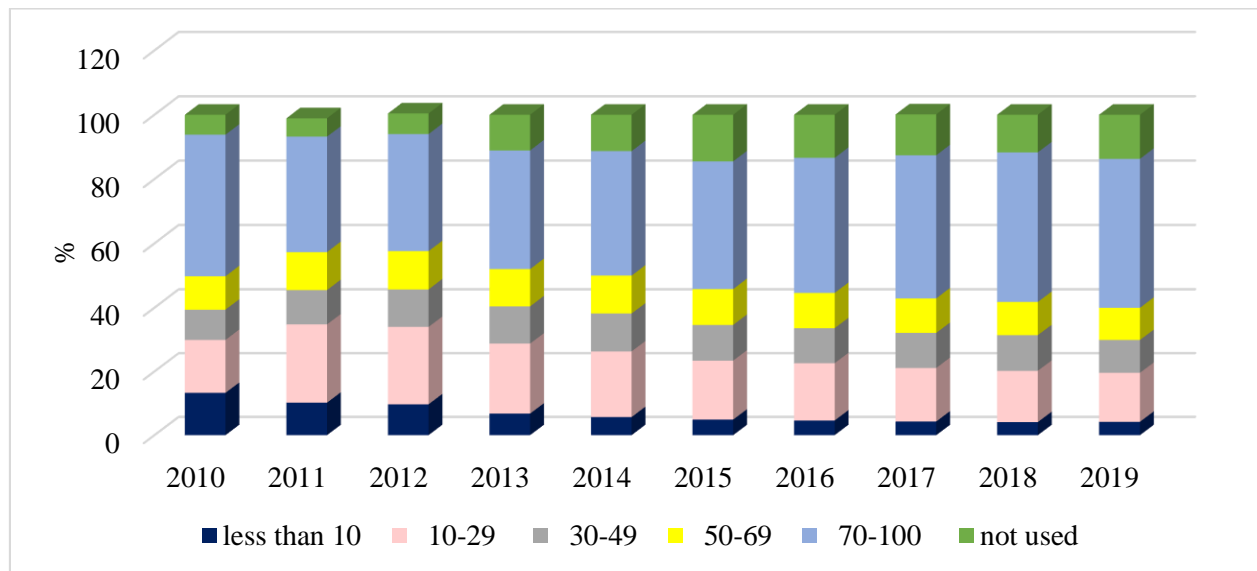


Figure 2. Distribution of organizations by the specific weight of the number of employees who used personal computers at the end of the year, % of the total number of surveyed organizations (Abdrakhmanova et al., 2021)

The widespread use of information and communication technologies in various fields of activity of enterprises and organizations not only increases the demand for ICT specialists, but also increases the demand for skills and competencies that complement ICT: for example, an ever-increasing volume of

information requires faster processing and analysis, which significantly increases the requirements for specialists of this level, necessitates close information exchange and cooperation between colleagues. For example, the skills of selling goods in a retail network are significantly different from the skills of making trade transactions in e-commerce.

In the Russian Federation, there have been significant changes in the scale of application of information and communication technologies by enterprises and organizations. If in 2019, compared to 2010, according to Federal State Statistics Service, the share of organizations using personal computers in their activities decreased slightly from 93.8% to 93.5%, then the share of organizations using servers in their activities increased from 18.2% to 53.8%, and those using global information networks - from 83.4% to 92.0%.

The process of digitalization affects all types Federal State Statistics Service of economic activity to one degree or another. Due to the transition to a new nomenclature of economic activities (OKVED2), the time period is limited to 2017-2019. If in 2017, according to Federal State Statistics Service, the largest share of organizations using personal computers in their activities was noted in the field of higher education, training of highly qualified personnel (98.4%), public administration and military security; social security (97.2%) and activities in the field of information and communications (97.0%), then 2019 the largest share of organizations using personal computers in their activities is observed in the field of public administration and military security; social security (97.1%), activities in the field of health and social services (96.8%) and activities in the field of information and communications (96.5%). According to data for 2019 in terms of specific weight, the share of organizations that have used in their activities is led by such activities as activities in the field of healthcare and social services (96.1%), financial and insurance activities (96.0%) and public administration and military security; social security (95.8%). The decrease in the considered indicators in this segment in 2019 compared to 2017 is due, in our opinion, to the complication of the economic situation of enterprises and organizations in certain types of economic activity (Table 3).

Table 3. Use of information and communication technologies in organizations by type of economic activity,% of the total number of surveyed organizations of the corresponding type of activity (Information Society in the Russian Federation, 2020)

	Organizations using			
	personal computers		global information networks	
	2017	2019	2017	2019
Total	92,1	93,5	89,7	92,0
Mining	90,7	87,3	89,0	85,8
Manufacturing industries	95,5	94,1	94,5	93,4
Provision of electric power, gas and steam; air conditioning	94,2	94,7	92,3	93,5
Water supply; sanitation, organization of waste collection and disposal, pollution elimination activities	85,5	90,1	82,1	88,3
Construction	88,9	84,2	87,1	83,1
Wholesale and retail trade; repair of motor vehicles, motorcycles	94,3	93,6	93,5	93,0
Transportation and storage	93,4	92,7	91,7	91,5
Activities of hotels and catering organizations	90,3	89,7	86,0	87,1
Information and communication activities	97,0	96,5	95,7	95,7
Financial and insurance activities	94,9	96,2	92,4	96,0
Real estate operations	65,6	87,5	62,6	86,1
Professional, scientific and technical activities	93,1	92,2	91,1	90,9

Administrative activities and related additional services	89,7	89,2	86,6	85,4
Public administration and military security; social security	97,2	97,1	95,0	95,8
Higher education; training of highly qualified personnel	98,4	95,9	97,1	94,7
Activities in the field of health and social services	96,8	96,8	95,0	96,1
Activities in the field of culture, sports, leisure and entertainment	91,1	92,4	84,5	87,9
Repair of computers, personal consumption items and household household items	93,5	88,2	92,4	86,9
Other activities	94,0	92,4	91,2	91,2

Digital economy workers should be able to generate and process complex information; think systematically and critically; make decisions by weighing various forms of evidence; ask meaningful questions on various subjects; be able to adapt and flexibly respond to new information; be creative; and be able to identify and solve real problems.

In Russia, employees of organizations are increasingly actively implementing information and telecommunication technologies in their production activities. If in 2015 40.7% of employees used personal computers at their workplace and 28.9% of employees used the Internet at least once a week from the average number of employees of organizations, then in 2019 these figures amounted to 45.0% and 35.4%, respectively. It should be noted that the highest values of the proportion of employees who used the Internet in their activities at least once a week are noted in financial and insurance organizations (86.5% and 66.0%, respectively), in higher education and training of highly qualified personnel (77.3% and 71.1%, respectively), as well as in the field of information and communications (82.0% and 75.7%, respectively).

The active use of digital technologies in enterprises and organizations of various fields of activity has led to a high demand for specialists in the field of ICT. According to Federal State Statistics Service, based on 10 thousand employees of organizations in the country, the number of specialists in the field of information and communication technologies increased from 213 people in 2015 to 229 people in 2019, and the number of specialists of a higher level of qualification increased by 11.5%, and the average level of qualification - only by 1.2%.

In the current conditions of the need for more active use of ICT, employees engaged in various fields of activity should have the competencies and skills to search and process a large array of data. The increasing use of digital technologies at work increases the demand for new skills in three areas. First, workers working in an ever-increasing range of professions should acquire general ICT skills. Secondly, the production of ICT products and services (software, web pages, e-commerce, cloud and big data) requires the skills of an ICT specialist for programming, application development and network management. Thirdly, the use of ICT changes labor functions and requires ICT-related skills (the ability to process complex information, communicate with colleagues and clients, plan in advance and quickly adjust). Certain skills are also needed to further effectively develop common, specific and complementary ICT skills.

In the conditions of digitalization of the Russian economy, specialists in the field of information and telecommunication technologies are needed in all types of economic activity, but there are significant differences in the level of their demand and, accordingly, employment. According to the number of ICT specialists in organizations of the Russian Federation in 2019, based on 10 thousand. the sphere of activity in the field of information and communication was the undisputed leader of employees of organizations, and in this type of economic activity the number of highly qualified specialists exceeded the number of employees of the average qualification level by 2.6 times (The President's message to the Federal Assembly, 2016; The proportion of organizations..., 2021). The high demand for ICT specialists is also observed in organizations of the financial and insurance sector and professional, scientific and technical

activities. At the same time, it should be noted that the number of specialists in the field of ICT in the field of information and communication is more than 8 times higher than the number of specialists in the field of information and communication technologies in such a type of activity as "higher education and training of highly qualified personnel", whose employees are just engaged, including training students in the use of ICT (Table 4).

Table 4. The number of specialists in information and communication technologies in organizations by type of economic activity in the Russian Federation in 2019 (people; per 10 thousand employees of organizations)

	Information and communication technology specialists	including	
		the highest level of qualifications	average skill level
Total	229	146	83
Agriculture, forestry, hunting, fishing and fish farming	60	22	38
Mining	64	43	21
Manufacturing industries	126	79	47
Provision of electric power, gas and steam; air conditioning	161	110	52
Water supply; sanitation, organization of waste collection and disposal, pollution elimination activities	103	58	45
Construction	55	26	29
Wholesale and retail trade; repair of motor vehicles, motorcycles	150	80	70
Transportation and storage	105	54	51
Activities of hotels and catering organizations	66	31	35
Information and communication activities	2341	1697	644
Financial and insurance activities	474	337	137
Real estate operations	211	107	104
Professional, scientific and technical activities	444	331	113
Administrative activities and related additional services	100	52	48
Public administration and military security; social security	240	131	109
Higher education; training of highly qualified personnel	288	195	93
Activities in the field of health and social services	91	42	49
Activities in the field of culture, sports, leisure and entertainment	135	54	81

As noted in the report "World Employment and Social Outlook 2021: The role of digital labor platforms in transforming the world of work", digital labor platforms provide new employment opportunities, including for women, disabled people, youth and those who are marginalized in traditional labor markets. The platforms also allow companies to gain access to a large flexible workforce with various skills, while expanding their customer base.

According to some experts, digitalization will lead to a significant reduction in the number of people employed in certain traditional economic activities (agriculture, transport, construction, etc.), while it is expected to lead to a reduction in the number of workers of average qualifications. At the same time, there is a need to increase the number of highly qualified workforce engaged in the creation and maintenance of robotics and automation systems, data analysts, programmers.

Table 5. Grouping of constituent entities of the Russian Federation by employment level in 2020, %

Population unemployment rate, %	Federal district	Subjects of the Russian Federation
2,1 – 4,0	Central	Kaliningrad region, Leningrad Region, Novgorod region
	Northwestern	Krasnodar Territory, Rostov Region, Sevastopol
	Privolzhsky	Republic of Bashkortostan, Republic of Mordovia, Perm Region, Kirov Region, Nizhny Novgorod Region, Orenburg Region, Penza Region, Samara Region, Saratov region, Ulyanovsk region
	Ural	Sverdlovsk region
	Far Eastern	Altai Krai, Krasnoyarsk Krai
4,1 – 6,0	Central	Primorsky Krai, Amur Region, Magadan Region, Sakhalin Region, Chukotka Autonomous Okrug
	Northwestern	Kaliningrad region, Leningrad Region, Novgorod region
	Southern	Krasnodar Territory, Rostov Region, Sevastopol
	Privolzhsky	Republic of Bashkortostan, Republic of Mordovia, Perm Region, Kirov Region, Nizhny Novgorod Region, Orenburg Region, Penza Region, Samara Region, Saratov region, Ulyanovsk region
	Ural	Sverdlovsk region
	Siberian	Altai Krai, Krasnoyarsk Krai
	Far Eastern	Primorsky Krai, Amur Region, Magadan Region, Sakhalin Region, Chukotka Autonomous Okrug
6,1 – 8,0	Central	Orel region, Yaroslavl region
	Northwestern	Komi Republic, Arkhangelsk Region, Vologda region, Murmansk Region, Pskov region
	Southern	Republic of Crimea, Astrakhan region, Volgograd region
	North Caucasian	Stavropol Territory
	Privolzhsky	Republic of Mari El, Udmurt Republic, Chuvash Republic
	Ural	Chelyabinsk region
	Siberian	Irkutsk region, Kemerovo region, Novosibirsk region
	Far Eastern	Republic of Sakha (Yakutia), Jewish Autonomous Region
8,1 – 10,0	Northwestern	Republic of Karelia
	Southern	Republic of Adygea, Republic of Kalmykia
	Ural	Kurgan region
	Siberian	Republic of Khakassia, Omsk region, Tomsk region
	Far Eastern	Trans-Baikal Territory
10,1 – 12,0	Far Eastern	Republic of Buryatia
12,1 – 15,0	North Caucasian	Kabardino-Balkarian Republic, Karachay-Cherkess Republic
	Siberian	Republic of Altai
15,1 – 20,0	North Caucasian	Republic of Dagestan, Republic of North Ossetia -Alania, Chechen Republic
	Siberian	Republic of Tyva
20.1 and more	North Caucasian	Republic of Ingushetia

The most difficult situation in the labor sphere is observed in the North Caucasian Federal District, in six subjects of which (out of 7 regions of the federal district) the unemployment rate of the population

exceeds 12.1%. And the most favorable situation remains in the Central and Volga Federal Districts, in the subjects of which the unemployment rate does not exceed 8.0% (Table 6).

Table 6. Number of constituent entities of the Russian Federation by unemployment rate in 2020

Federal district	Number of constituent entities of the Russian Federation by unemployment rate, %								
	2,1 - 4,0	4,1 - 6,0	6,1 - 8,0	8,1 - 10,0	10,1 - 12,0	12,1 - 15,0	15,1 - 20,0	20,1 and more	
Central	3	13	2	-	-	-	-	-	-
Northwestern	1	3	5	1	-	-	-	-	-
Southern	-	3	3	2	-	-	-	-	-
North Caucasian	-	-	1	-	-	2	3	1	
Privolzhsky	1	10	3	-	-	-	-	-	-
Ural	1	1	1	1	-	-	-	-	-
Siberian	-	2	3	3	-	1	1	-	-
Far Eastern	2	5	2	1	1	-	-	-	-

One of the ways to reduce the unemployment rate in the country and ease tensions in the labor market, in our opinion, is the possibility of professional retraining and further employment of persons registered in employment centers.

According to the Forecast of the Ministry of Economic Development of the Russian Federation, the economic recovery in 2021 will be accompanied by an improvement in the labor market situation. The average unemployment rate for 2021 will be 5.2%. At the same time, by the end of next year, the unemployment rate will fall below 5%. In 2022-2023, the unemployment rate is projected at 4.7% and 4.6%, respectively.

The digital economy needs highly qualified personnel with knowledge and competencies not only in the field of economic and mathematical disciplines, but also in the field of information technology. The demand for highly qualified specialists in Russia in the conditions of digitalization of the economy has led to the need for structural changes in the training of specialists of this level, i.e. an increase in the number of students studying in such areas of training as "Informatics", "Information Technology". Due to the needs of the labor market, the number of students admitted to state educational organizations of higher education and scientific organizations in the field of computer Science and computer Engineering, per 100,000 people of the population, increased in the country by 43.3% compared to 2015, amounting to 149 people in 2019, according to Federal State Statistics Service. (by 43.3%). The graduation of bachelors, specialists, masters by state educational organizations of higher education and scientific organizations in the field of training "Computer Science and computer engineering" per 100,000 people of the employed population increased from 60 people to 78 people from 2015 to 2019.

Much attention is also paid to the material and technical base when teaching schoolchildren and students information technologies in educational institutions of all levels. If in higher educational institutions the number of personal computers used for educational purposes that have access to the Internet, per 100 enrolled students for the period from 2011 to 2019 has not changed and amounted to 25 units, according to Federal State Statistics Service, then in general education institutions this indicator has increased from 9 units to 11 units, and in secondary vocational education institutions - from 11 units. up to 14 units, which not only makes it much easier for students to find the necessary information, but also contributes to the acquisition of skills and competencies in the application of information and communication technologies in various fields of activity. In the future, such specialists will join the workforce and will widely use ICT in their activities.

4. CONCLUSION

The program "Digital Economy of the Russian Federation" defines five basic directions of development of the digital economy in Russia for the period up to 2024: regulatory regulation; personnel and education; formation of research competencies and technical reserves; information infrastructure; information security. Each of the directions is directly related to the development of the labor market and involves improving the process of its regulation.

An important condition for the existence and source of development of the employment system in the digital economy is internal diversity, which allows the subjects of the labor market to use their "assets" most effectively. The range of new forms of employment directly related to the use of modern ICT is expanding (remote employment, freelancing, crowdsourcing, etc.).

Digitalization transforms the competence space, generating demand for new skills, causing significant changes in the professional and qualification structure of employment. The gap between the competencies that the subjects of the labor market receive in educational institutions and the professional competencies demanded by the labor market is growing. At the same time, in order to fill the demand for the economy with highly qualified personnel in the field of information technology, it is necessary to develop computer literacy of the population; to make adjustments to the training programs of students in the relevant disciplines; to develop a system of retraining of employees in the field of ICT. In the coming years, the most popular specialties, in our opinion, will be specialists in the field of creation and maintenance of robotics, developers of new applications and technologies, artificial intelligence, data analytics, etc.

The use of digital platforms will ensure the reliability of information about the required competencies to the applicant and full transparency about the availability of jobs; will contribute to the rapid matching of labor supply and demand in time and spatial space and a more accurate match of the applicant's profile of the proposed vacancy, which should help to increase labor productivity.

The use of digital technologies will have a positive impact on the labor market: they will facilitate the search for personnel, shorten the time of job search, increase employee productivity, improve the situation with the involvement of personnel in the economy with the help of remote jobs and provide access to quality education.

Human capital is a key factor in the competitive Russian digital economy. The evolution of social relations has led to the fact that information, knowledge and digital personnel are becoming an important factor of production.

In modern conditions, the specifics of the current situation on the labor market is that during periods of crises and recession of production in Russia, employment at large industrial enterprises mainly suffered, and the sector of trade, market services, small and microenterprises, primarily in large cities, absorbed the released workers. Currently, it is the services and trade sector, the small business sector that is suffering the most, and the self-employment segment concentrated in the service sector has also been hit.

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