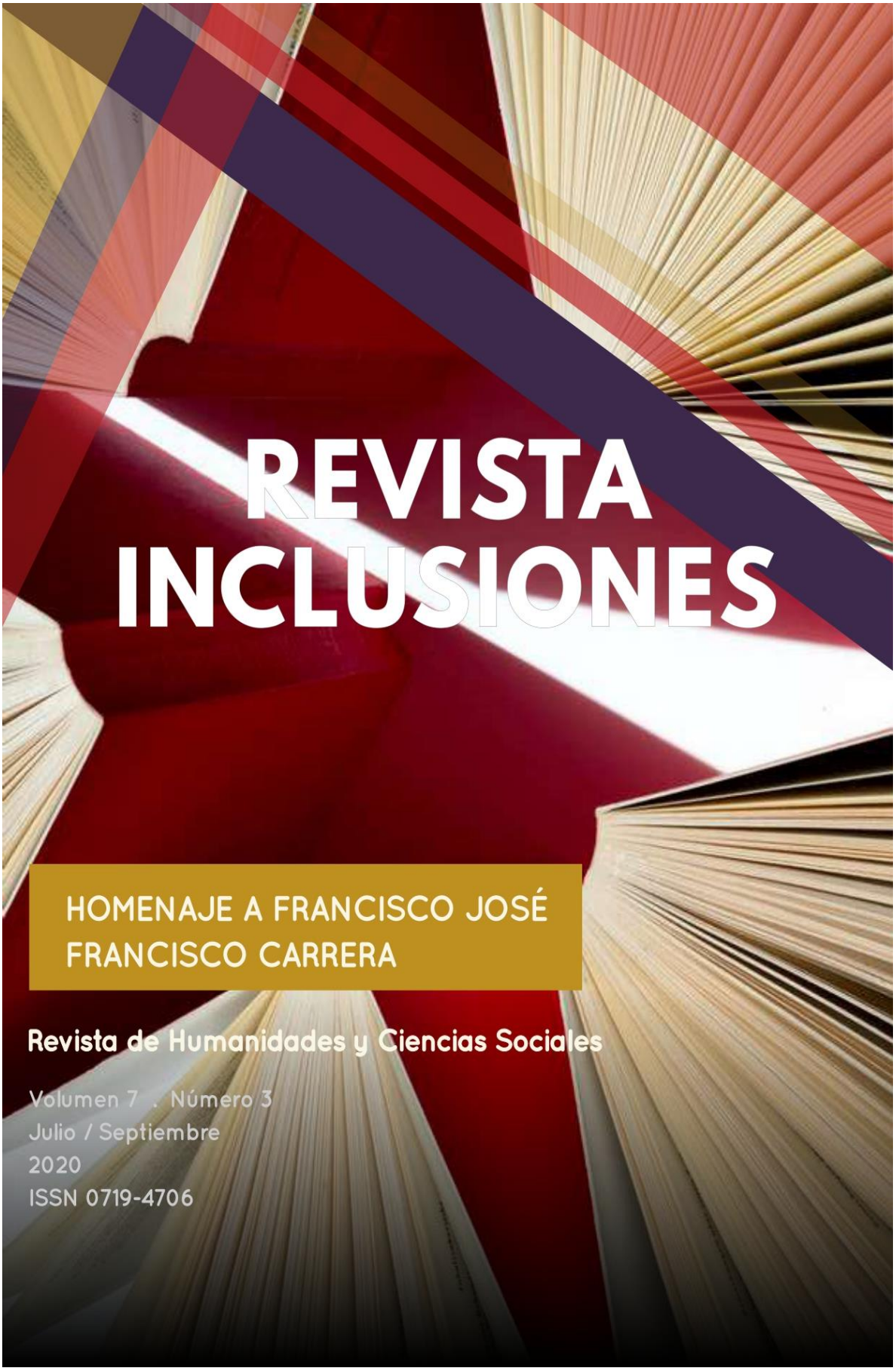
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DIGITAL TRANSFORMATION OF THE LABOR MARKET

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Abstract

Today, the digital transformation of the world economy has become an objective reality. The steady growth in the availability and, as a result, the prevalence of high-speed Internet, the increasing level of autonomy of production and logistics, and the development of digital infrastructure lead to a complex transformation of both markets and industries in general and consumer groups, manufacturers, and retailers in particular. The result of these processes is a radical transformation of the complex of demanded knowledge, skills, and abilities. However, the labor market is formed under the influence of both economic and social processes, which significantly increases its complexity as an object of analysis. The multidimensional impact of digital transformation on the labor market is ambiguous, and the potential synergistic effect of the impact of particular manifestations of digital transformation processes can be both positive and negative. The consequences of such a transformation can be revolutionary. Thus, the problem of effective assessment of the consequences of labor market transformation under the influence of digitalization is extremely relevant. The purpose of this work is to formalize the mathematical vectors of influence of digitalization factors on the development of the labor market. To achieve this goal, digitalization is presented in the form of quantified factors expressed using specific indicators, and the unemployment rate is used as an indicator of the labor market. The main research tool is the regression analysis. As a result, a regression model is obtained that expresses the dualistic nature of the impact of digitalization on the development of the labor market.

Keywords
Digital transformation – Labor markek – Unemployment – ICT costs

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Introduction

Today, the process of transformation of public institutions is inevitably associated with digitalization. An increasing proportion of the population is reorienting from the production of traditional types of values to the accumulation, storage, search, processing, and redistribution of information, while the information itself becomes a product of consumption. Thus, the labor market is becoming one of the key objects of digital transformation.

The advent of the digital age around the world is clearly illustrated by the dynamics of Internet use by the population of the EU countries (Fig. 1).

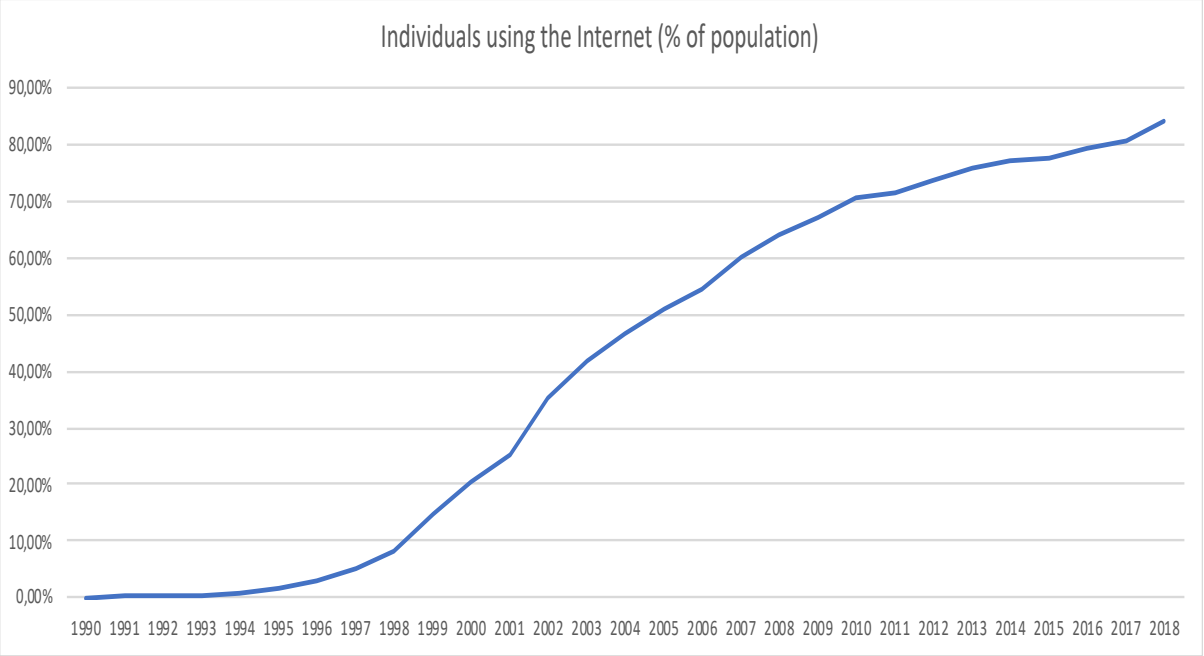

Figure 1
The use of the Internet by EU countries[1]

The graph demonstrates a positive trend, indicating a steady increase in Internet penetration in society. The number of patents in the field of ICT in most countries has increased, which indirectly confirms the hypothesis of the widespread introduction of digital technologies in all spheres of society.

Thus, digitalization is an existing trend that is characterized by the digital transformation of a significant part of the elements of professional and social life. Therefore, humanity needs to create a development strategy in the conditions of digitalization for correct perception by the society of the introduction of digital technologies in all spheres of life.

[1] Individuals using the Internet. The World Bank Group. Available at: https://data.worldbank.org/indicator/IT.NET.USER.ZS

Digitalization of the labor market is manifested in a variety of complex changes. In particular, let us consider the dynamics of the use of robotic technology by European countries in various industries (Fig. 2).

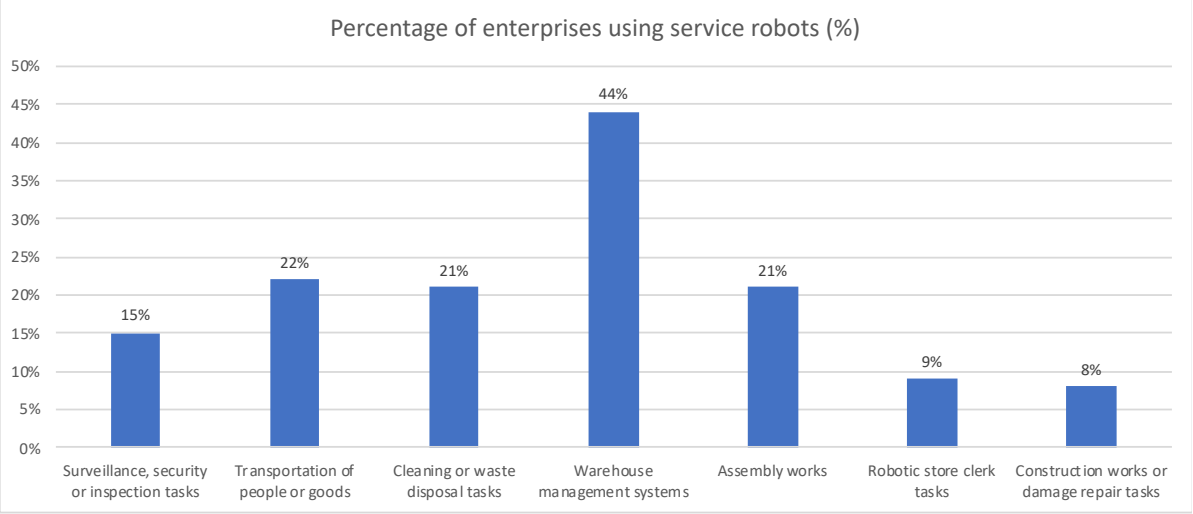

Figure 2
The use of robotic technology in various industries by European countries[2]

It is worth noting that the use of robotic technology at enterprises leads to an increase in the unemployment rate.

Based on all the above, it is possible to conclude that it is necessary to identify and analyze the factors of digitalization that may affect the labor market.

Identification of these factors will solve such problems as:

- retraining and advanced training, which will reduce the shortage of highly qualified personnel;
- increasing a country's competitive position in the knowledge economy;
- increasing the share of high-tech production;
- increasing the number of high-performance jobs;
- increasing labor productivity in general.

The object of this research is the labor market in the Russian Federation. The subject of the research is the structure of the labor market.

The purpose of this work is to formalize the mathematical vectors of influence of digitalization factors on the development of the labor market.

[2] 25% of large enterprises in the EU use robots. Eurostat. Available at: https://ec.europa.eu/eurostat/web/products-eurostat-news/-/DDN-20190121-1?inheritRedirect=true

Theoretical basis

It is necessary to analyze the work of world scholars in this field to formulate further hypotheses in this study. The Australian Industry Group's report on the development of the work environment in the digital future focuses on the implications of the transformation of the Australian labor market in a digitalized environment. It is noted that the availability of immediate access to information around the world has affected the speed of technology and innovation, which leads to automation. The "polarization" of labor has become a key change in the past few decades, with wage increasing disproportionately higher than that of those at the upper and lower levels of the income distribution. Polarization in this context means the disappearance of the middle class. The main explanation for the emergence of labor market polarization is that ICT perform routine tasks, previously performed by the middle class[3]. Data collection and processing are also elements of the workplace that have the potential for automation. Activities in areas such as purchasing, payroll, billing, and logistics include data management that can be automated. According to Christian Bührer and Christian Hagist, with the advent of affordable neural networks and machine learning, big data will allow companies to process more information at a lower cost, potentially even performing certain professional functions in areas such as legal services, medical diagnostics, and financial analytics. A relatively small percentage of professions can be fully automated by adapting existing technologies, but, in general, certain types of professional activity in almost all professions can be automated[4]. A similar point of view is expressed by Frank Bensberg, Gandalf Buscher, and Christian Czarnecki in their work[5]. Therefore, it can be assumed that as the tools for collecting and analyzing data improve, fewer workers will be required, which in turn will lead to an increase in unemployment. While investigating the needs for human resources competencies, the authors concluded that teaching so-called digital literacy should start from school and be studied along with subjects such as English and Mathematics[6]. The state of the European labor market differs slightly from Australian. However, job losses are offset by an influx of demand in other areas, which should eventually lead to a stable level of employment. In the European labor market, there is an increased demand for workers with higher qualifications in the field of digital knowledge. The strategy of the EU, which is to minimize the gap between supply and demand in the labor market in a digitalized economy, should similarly be implemented by improving the digital skills of the population, in other words, by increasing digital literacy. There js a correlation (85%) between digital skills and the level of employee competitiveness[7].

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[3] Developing the workforce for a digital future. AI group report. Available at: https://cdn.aigroup.com.au/Reports/2018/Developing_the_workforce_for_a_digital_future.pdf

[4] C. Bührer y C. Hagist, The Effect of Digitalization on the Labor Market (Verlag: Palgrave Macmillan UK, 2017).

[5] F. Bensberg; G. Buscher y C. Czarnecki, Digital Transformation and IT Topics in the Consulting Industry: A Labor Market Perspective. In: Nissen V. (eds) Advances in Consulting Research. Contributions to Management Science (Springer, Cham, 2018).

[6] F. Abdullaev; K. Khamraev; S. Arzuova y A. Abdukayumov, “Digital Transformation of Market Institutions”, Journal of Southwest Jiaotong University Vol: 54 num 2 (2019): 1-9 y G. Marzano; M. Grewinski; J. Lizut y M. Kawa, Labor Market Challenges in the Digital Era. Conference: 8th International Conference "Economics and Management-Based on New Technologies" EMoNT-2018 25-28 June 2018, At Vrnjacka Banja, Serbia. 2018.

[7] E. Titan; A. Burciu; D. Maneay y A. Ardelean, “From traditional to digital: the labour market demands and education expectations in a EU context”, Procedia: Economics and Finance num 10 (2014): 269-274 y M. Laužikas y A. Miliūtė “Human reseource management effects on sustainability

Therefore, according to researchers, it is necessary to take measures to improve the skills of teachers by providing computers and high-speed Internet connection in all educational institutions[8].

Most foreign researchers in this field come to the conclusion that digital literacy is necessary for the population to further adapt to life in a digital environment. However, the question arises: what skills should be developed in a person? Swedish researcher Martin Blix, investigating this issue, claims that the salary of people with high skills in terms of cognitive or social abilities has positive dynamics in contrast to people who perform routine work. These skills can be combined into so-called soft skills, which are currently impossible to automate. These skills include the ability to work in a team, the ability to prioritize, conflict resolution skills, etc.[9]. Speaking about Russian research on digitalization of the labor market, it is possible to say that the opinions of Russian and foreign authors are similar. However, the authors of the collection of the Higher School of Economics "Digital Economy: Global Trends and Practice of Russian Business" consider the state of the labor market not only from a negative point of view (increase in unemployment) but also from a positive one. The spread of information about employing companies and potential candidates has significantly increased due to the Internet and specialized web services, which allows evaluating the degree of satisfaction with employees at their place of work. The authors also consider the problem of increased competition between employer companies due to the development of digital technologies. In this context, the millennial generation (young people born in the 1980-90s) becomes the most preferred. This is due to the fact that the gap in digital knowledge that is currently in demand between generations is quite large[10]. Based on the above, the question arises: what will happen to the older part of the population (35 years and older)? The answer to this question is given by V.M. Svistunov and V.V. Lobachev, arguing that the able-bodied population needs to gain new competencies, while the government authorities need to develop a retraining system for various industries and fields of activity and revise the system of professional standards by industry. The discrepancy between the working-age population of the country and the new economic reality will lead to the loss of Russia's competitiveness in world markets and, as a result, a lag in economic development and a sharp decline in the standard of living of the population[11].

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of high-tech companies: what Lithuania and South Korea can learn from each other", Insights into Regional Development Vol: 2 num 2 (2020): 562-579.

[8] I. Czaja y M. Urbaniec, "Digital Exclusion in the Labour Market in European Countries: Causes and Consequences", European Journal of Sustainable Development Vol: 8 num 5 (2019): 324-336.

[9] M. Blix, "The effects of digitalization on labor market polarization and tax revenue", CeSifo Forum Vol: 4 (2017): 9-14; K. Dengler y B. Matthes, "The impacts of digital transformation on the labour market: Substitution potentials of occupations in Germany". Technological Forecasting and Social Change. 2018; K. Dengler y B. Matthes, "The impacts of digital transformation on the labour market: Substitution potentials of occupations in Germany", Technological Forecasting and Social Change. 2018; B. A. Erznkyan y S. M. Arutyunyan, Labor market in the digital era", Economic Analysis: Theory and Practic Vol: 17 (2018): 1388-1408 y M. A. Alajmi, "The impact of E-portfolio use on the development of professional standards and life skills of students in the Faculty of Education at Princess NouraBint Abdul Rahman University", Entrepreneurship and Sustainability Issues Vol: 6 num 4 (2019): 1714-1735.

[10] Digital economy: global trends and practice of Russian business. Higher School of Economics. Available at: https://imi.hse.ru/data/2017/10/06.pdf

[11] V. M. Svistunov y V. V. Lobachev, Trudovye otnosheniya v usloviyakh tsifrovizatsii ekonomiki [Labor relations in digitalization of the economy]. Shag v budushchee: iskusstvennyi intellekt i tsifrovaya ekonomika (Moscow: GUU, 2017).

Combining all the information revealed in the course of literature review, it is possible to conclude that the main problems which the labor market may face in the conditions of digitalization of the economy are the following[12]:

- job cuts associated with the growing irrelevance of many professions;
- increase in unemployment;
- reduction of wages;
- increased competition between employer companies.

To solve the above problems, it is necessary to train the population in so-called digital literacy. In other words, it is necessary to conduct courses on the study of information technologies to increase the digital knowledge of the population[13].

Also, soon, highly qualified specialists will need to have a certain set of competencies to continue their professional activities and avoid salary or job cuts. At the moment, the list of such competencies cannot be formed yet, because it is difficult to predict what personnel will be in demand in the future. This is due to the fact that the speed of digital technology adoption is faster than the speed of new jobs[14].

In modern conditions, the labor market is one of the indicators that can be used to judge the stability and effectiveness of a municipal entity's transformation. This study identified the main factors that affect the labor market.

The demand for labor can be expressed by such an indicator as unemployment. Consequently, the lower the demand, the higher the unemployment rate. This indicator was selected as the resulting feature when conducting the study. It should also be assumed that high technical equipment of production (for example, the introduction of

[12] A. Izmailova, “The impact of digital economy on the transformation of the labor market and forming new business models”, Russian Journal of Industrial Economics Vol: 11 (2018): 296-304 y V. V. Pshenichnikov y A. V. Babkin, Digital money as a product of the development of information and telecommunication technologies. Proceedings of the 2017 International Conference "Quality Management, Transport and Information Security, Information Technologies", IT and QM and IS 2017. 2017.

[13] A. V. Babkin; D. D. Burkaltseva; A. V. Betskov; H. S. Kilyaskhanov; A. S. Tyulin y I. V. Kurianova, “Automation digitalization blockchain: Trends and implementation problems”, International Journal of Engineering and Technology Vol: 7 num 14 (2018): 254-260; D. S. Demidenko; V. V. Kulibanova y V. G. Maruta, Using the principles of "digital economy" in assessing the company's capitalization. Proceedings of the 31st International Business Information Management Association Conference. 2018; M. Galimova; T. Gileva; N. Mukhanova y L. Krasnuk. Selecting the path of the digital transformation of business-models for industrial enterprises. IOP Conference Series: Materials Science and Engineering. 2019 y E. A. Gromova, “Digital economy development with an emphasis on automotive industry in Russia”, Espacios Vol: 40 num 6 (2019).

[14] A. V. Bataev; Analysis and development of the digital economy in the world. Proceedings of the 31st International Business Information Management Association Conference. 2018; A. V. Bataev; A. A. Gorovoy y A. Mottaeva, Digital transformation of the financial sector in Russia and the world. Proceedings of the 32nd International Business Information Management Association Conference. 2018; A. V. Bataev y E. V. Plotnikova, “Assessment of digital banks' performance”, Espacios Vol: 40 num 20 (2019) y V. Schepinin y A. Bataev, “Digitalization of financial sphere: Challenger banks efficiency estimation”, IOP Conference Series: Materials Science and Engineering. 2019.

technological processes) can reduce the demand for labor, thereby increasing the unemployment rate[15].

Considering the assumption about the impact of innovation processes on the state of the labor market, the innovative factors that can influence the preferred indicator were selected.

One of the elements that undoubtedly influence the assessment of a country's innovation level is the level of financial expenditures of the state for technological development. Therefore, this factor can be expressed as a statistical indicator such as the cost of ICT[16].

The next factor that determines the level of innovative development may be the availability of access to the network. This factor can be expressed as an indicator of the share of organizations that use Internet access.

The remaining factors that characterize a country's innovation development can be expressed in terms of the number of registered patents, as well as the number of goods that were shipped for ICT (exports of ICT-related goods).

Methods

All values of statistical indicators were taken from the official website of the State Statistics Service for the period from 2010 to 2016.

Once the indicators that are supposed to affect unemployment were determined, a multiple regression model was constructed, where x_1, x_2, x_3, and x_4 were: share of organizations using Internet access; ICT costs; imports of ICT-related goods; ICT patents. As indicated earlier, the resulting indicator (y) was the unemployment rate. The econometric model was built using the IBM SPSS software package.

The following methodological framework was used:

- The P-level indicator was used to determine the probability of an erroneous deviation of the null hypothesis;
- The coefficient of determination was used to determine the proportion of variation in the effective attribute y under the influence of the factor attribute x;
- To determine the probability of an erroneous deviation of the null hypothesis, the P-level indicator was used;

[15] S. Tul, Systemic transformation of business and labor market in the conditions of digitalization. Problems of systemic approach in the economy. 2019 y E. Zhilenkova, M. Budanova, N. Bulkhov, D. Rodionov, Reproduction of intellectual capital in innovative-digital economy environment. IOP Conference Series: Materials Science and Engineering Vol: 497 num 1 (2019).

[16] L. V. Nikolova; D. G. Rodionov y A., Litvinenko, Sustainability of the business in the conditions of globalization. Proceedings of the 30th International Business Information Management Association Conference. 2017.

- The average approximation error is was used to evaluate the quality of the regression equation;

- The elasticity coefficient was used to determine the % of the change in the value of the output variable when the factor variable changes by 1%.

After conducting a regression analysis, a conclusion was made about the impact (or lack thereof) of digital development indicators on the unemployment rate.

Results

As a result of the analysis of the influence of the previously considered indicators on the unemployment rate, the following characteristic factors were selected that can influence the characteristic result:

- percentage of organizations using Internet access (x_1);

- cost of ICT (x_2);

- import of ICT goods (x_3);

- ICT patents (x_4).

The model is as follows:

$$Y = -0{,}12 \times X_1 + (8{,}14\text{E} - 10) \times X_2 + (1{,}21\text{E} - 07) \times X_3 + (6{,}51\text{E} - 05) \times X_4$$

The calculated value of the f-criterion is greater than the table value (28.75 > 19.25), which indicates that this model is fair. The coefficient of determination that determines the percentage of the spread of the dependent variable, which is explained by regression *Y* on *X*, is 0.98. This suggests that 98% of the unemployment rate is determined by the selected *X* indicators. In this model, the p-value that shows the probability of error when rejecting the null hypothesis is 0.05 for x_1, 0.47 for x_2, 0.86 for x_3, and 0.82 for x_4. It follows that it is worth excluding x_3 and x_4 from the model, i.e. the indicator of imports of ICT goods and the indicator of ICT patents. Then the final model is two-factor, and the regression equation has the following form:

$$Y = 12{,}7 - 0{,}1 \times X_1 + (1{,}1098\text{e} - 09) \times X_2$$

The coefficient of determination, in this case, is 0.97, which is more than significant. The elasticity coefficient was -1.34 for x_1, meaning that unemployment will decrease by 1.34% with an increase in the share of organizations using Internet access by 1%. The same coefficient for x_2 is 0.18. Consequently, the unemployment rate will increase by 0.18% with an increase in ICT spending by 1%. The average approximation error, which shows the average deviation of the calculated indicators from the actual ones, is (1.81 E-02), that is, the value of the indicator is infinitely small. The graph below shows the dynamics of actual and forecast values of the unemployment rate, enclosed in the upper and lower borders of the interval (Fig. 3).

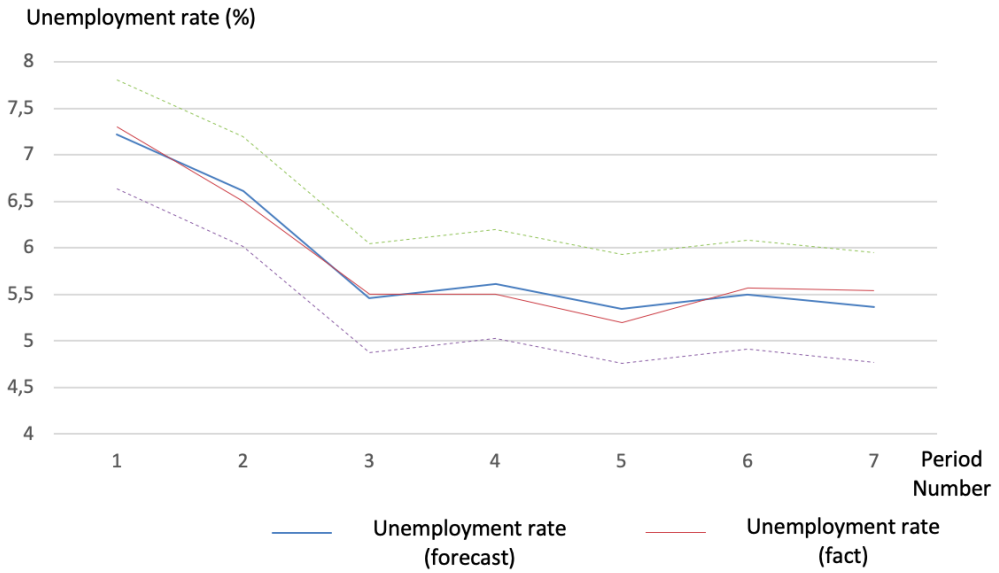

Figure 3
Confidence intervals of the forecast

As can be seen from the graph, the calculated and actual values of the unemployment rate are almost identical, as evidenced by the value of the approximation error indicator. These values do not exceed the confidence interval.

Discussion

According to the obtained results, it can be concluded that digitalization has a dualistic effect on the labor market. On the one hand, one of the factors that significantly affect the labor market is the cost of ICT. This factor has a direct impact on unemployment, and when it increases, the unemployment rate also increases. First of all, this may be due to the fact that this type of expenditure is carried out to reduce labor intensity by attracting new high-tech equipment. In turn, the emergence of new technologies in the enterprise reduces the need for some specialists due to automation. For example, the introduction of high-performance machines that can replace humans reduces the need for many professions. This problem is extremely relevant in modern realities, since the process of the digital transformation of the economy is undeniable and the risk of increasing unemployment is quite high. This specificity has been described by many researchers, as was previously highlighted in this article.

However, in addition to the negative impact, digitalization has a positive impact on the labor market, which is expressed through such an indicator as the share of organizations with Internet access. This information may be related to the fact that new specialties appear with the development of the Internet, such as Internet marketers, SEO specialists, SMM managers, etc. Thus, digitalization should be accompanied by a parallel transformation of the education system. Timely formation of students' current knowledge, skills, and abilities (at all levels of education), as well as the formation of training programs for specialists in new areas, will help compensate for the negative effect of digitalization and minimize social damage.

Conclusion

As a result of the study, an econometric model was formed, which showed that unemployment is affected by two indicators: the share of organizations with Internet access and the cost of ICT. However, as the percentage of organizations using Internet access increases, the unemployment rate decreases. The study also showed that as ICT costs increase, the unemployment rate increases. By analyzing and comparing the results of the current study with earlier ones, it is possible to establish the main criterion for evaluating the impact of digitalization on the labor market. This criterion is the unemployment rate. Most scientists have concluded that unemployment is constantly increasing with the advent of digital technologies. The conducted econometric research also confirms this thesis. However, the emergence of new specialties and increasing digital literacy of the population may be able to solve this problem. In the framework of further research, it is planned to study in more detail the impact of these factors on national labor markets, as well as to explore the complex of new relevant knowledge, skills, and abilities that are formed as a result of digital transformation.

References

25% of large enterprises in the EU use robots. Eurostat. Available at: https://ec.europa.eu/eurostat/web/products-eurostat-news/-/DDN-20190121-1?inheritRedirect=true

Abdullaev, F.; Khamraev, K.; Arzuova, S. y Abdukayumov, A. “Digital Transformation of Market Institutions”. Journal of Southwest Jiaotong University Vol: 54 num 2 (2019): 1-9.

Alajmi, M. A. “The impact of E-portfolio use on the development of professional standards and life skills of students in the Faculty of Education at Princess NouraBint Abdul Rahman University”, Entrepreneurship and Sustainability Issues Vol: 6 num 4 (2019): 1714-1735.

Babkin, A. V.; Burkaltseva, D. D.; Betskov, A. V.; Kilyaskhanov; H. S.; Tyulin, A. S. y Kurianova, I. V. “Automation digitalization blockchain: Trends and implementation problems”. International Journal of Engineering and Technology Vol: 7 num 14 (2018): 254-260.

Bataev, A. V. Analysis and development of the digital economy in the world. Proceedings of the 31st International Business Information Management Association Conference. 2018.

Bataev, A. V.; Gorovoy; A. A. y Mottaeva, A. Digital transformation of the financial sector in Russia and the world. Proceedings of the 32nd International Business Information Management Association Conference. 2018.

Bataev, A. V. y Plotnikova, E. V. “Assessment of digital banks' performance”. Espacios Vol: 40 num 20 (2019): 24.

Bensberg, F.; Buscher, G. y Czarnecki, C. Digital Transformation and IT Topics in the Consulting Industry: A Labor Market Perspective. In: Nissen V. (eds) Advances in Consulting Research. Contributions to Management Science. Cham: Springer. 2018.

Blix, M. “The effects of digitalization on labor market polarization and tax revenue”. CeSifo Forum Vol: 4 (2017): 9-14.

Bührer, C. y Hagist, C. The Effect of Digitalization on the Labor Market. Verlag: Palgrave Macmillan UK. 2017.

Czaja, I. y Urbaniec, M. “Digital Exclusion in the Labour Market in European Countries: Causes and Consequences”. European Journal of Sustainable Development Vol: 8 num 5 (2019): 324-336.

Demidenko, D. S.; Kulibanova; V. V.; Maruta y V. G. Using the principles of "digital economy" in assessing the company's capitalization. Proceedings of the 31st International Business Information Management Association Conference. 2018.

Dengler, K. y Matthes, B. The impacts of digital transformation on the labour market: Substitution potentials of occupations in Germany. Technological Forecasting and Social Change. 2018.

Developing the workforce for a digital future. AI group report. Available at: https://cdn.aigroup.com.au/Reports/2018/Developing_the_workforce_for_a_digital_future.pdf

Digital economy: global trends and practice of Russian business. Higher School of Economics. Available at: https://imi.hse.ru/data/2017/10/06.pdf

Erznkyan, B. A. y Arutyunyan, S. M. “Labor market in the digital era”. Economic Analysis: Theory and Practic Vol: 17 (2018): 1388-1408.

Galimova, M.; Gileva, T.; Mukhanova, N. y Krasnuk, L. Selecting the path of the digital transformation of business-models for industrial enterprises. IOP Conference Series: Materials Science and Engineering. 2019.

Gromova, E. A. “Digital economy development with an emphasis on automotive industry in Russia”. Espacios Vol: 40 num 6 (2019).

Individuals using the Internet. The World Bank Group. Available at: https://data.worldbank.org/indicator/IT.NET.USER.ZS

Izmailova, A. “The impact of digital economy on the transformation of the labor market and forming new business models”. Russian Journal of Industrial Economics Vol: 11 (2018): 296-304.

Laužikas, M. y Miliūtė, A. “Human reseource management effects on sustainability of high-tech companies: what Lithuania and South Korea can learn from each other”. Insights into Regional Development Vol: 2 num 2 (2020): 562-579.

Marzano, G.; Grewinski; M., Lizut; J. y Kawa, M. Labor Market Challenges in the Digital Era. Conference: 8th International Conference "Economics and Management-Based on New Technologies" EMoNT-2018 25-28 June 2018, At Vrnjacka Banja, Serbia.

Nikolova, L. V.; Rodionov, D. G. y Litvinenko, A. N. Sustainability of the business in the conditions of globalization. Proceedings of the 30th International Business Information Management Association Conference. 2017.

Pshenichnikov, V. V. y Babkin, A. V. Digital money as a product of the development of information and telecommunication technologies. Proceedings of the 2017 International Conference "Quality Management, Transport and Information Security, Information Technologies", IT and QM and IS 2017. 2017.

Rodionov, D. G.; Kudryavtseva, T. J. y Skhvediani, A. E. “Human development and income inequality as factors of regional economic growth”. European Research Studies Journal Vol: 21 num 2 (2018): 323-337.

Schepinin, V. y Bataev, A. “Digitalization of financial sphere: Challenger banks efficiency estimation. IOP Conference Series: Materials Science and Engineering. 2019.

Svistunov, V. M. y Lobachev, V. V. Trudovye otnosheniya v usloviyakh tsifrovizatsii ekonomiki. Moscow: GUU. 2017.

Titan, E., Burciu; A., Manea, D. y Ardelean, A. “From traditional to digital: the labour market demands and education expectations in a EU context”. Procedia: Economics and Finance num 10 (2014): 269-274.

Tul, S. Systemic transformation of business and labor market in the conditions of digitalization. Problems of systemic approach in the economy. 2019.

Zhilenkova, E.; Budanova, M.; Bulkhov, N. y Rodionov, D. “Reproduction of intellectual capital in innovative-digital economy environment”. IOP Conference Series: Materials Science and Engineering Vol: 497 num 1 (2019).

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