

Risks and Threats to the Economic Security of a Region in the Digital Economy

Nikolaev M.A.

Pskov State University,
Pskov, Russia,
mihaelnikolaev@mail.ru

Makhotaeva M.Yu.

Pskov State University,
Pskov, Russia,
makhotaeva@mail.ru

Abstract— The object of this paper is to systematize the risks and threats to the economic security of the region arising from the digital transformation of the economy. Digitalization is changing the landscape of all forms of social and economic relations. In addition to new opportunities, previously unknown risks are emerging. Their neglect and lack of adequate countermeasures pose threats to national security. A comprehensive analysis of the provisions of planning documents and scientific literature made it possible to systematize the risks and threats to the economic security of the region. As the main classification criterion, it is proposed to use the object of influence of adverse factors and the nature of the impact. From the point of view of impact on the socio-economic development of the region, the greatest risks are social risks associated with rising unemployment, widening income gap and growing poverty, as well as risks associated with human resources. A systematic analysis of regional planning documents showed that they are focused on macroeconomic risks. The risks associated with the digital transformation of the economy have received much less attention. Most regions report low unemployment and predict its further decline. Particular attention is paid to the risks of increasing poverty, criminalization of the Internet, increasing differentiation of the population in terms of income and wages, threats to information security, digital inequality.

Keywords— *digital economy, economic security, region, risks, threats*

I. INTRODUCTION

Expanding the use of digital technologies is a strategic objective of the social and economic policy of the Russian Federation. The development of the digital economy can provide an answer to the problem of the shrinking of the labour force and serve as an additional factor of economic growth; at the same time, however, it can lead to a significant fall in employment, and the increase in unemployment among middle- and low-skilled workers. Thus, the high rate of digital penetration, not only in economic activities but in virtually all spheres of activity, creates new opportunities for social and economic development, but also creates new challenges and threats.

The realization of the digital economy possibilities requires the maximum use of the potential of the constituent

entities of the Russian Federation. At the same time, the digital transformation of the economy at the regional level has been uneven. Highly developed regions tend to have higher rates of digitalization and thus gain additional competitive advantages. As a result, the negative trend of increasing socio-economic differentiation of regions is gaining momentum. At the same time, the Strategy for Economic Security of the Russian Federation up to 2030 considers the intensification of territorial differentiation according to the level and pace of social and economic development as a threat to economic security. In this context, the task of studying the complex issues of ensuring the economic security of the region in the digital economy is being updated. It requires a systematization of risks and threats as well as features of the economic security mechanism in the transition to a digital economy.

The economic security of the region is considered in scientific literature mainly from the perspective of ensuring the sustainable development of all spheres of activity under conditions of influence of destabilizing internal and external socio-economic factors [1, 2].

The paper [3] systematized the approaches to defining the essence of the region's economic security and highlighted the following concepts: regional, national, as well as the concept of a quasi-state. The first concept gives priority to regional economic security and considers it to be the basis of national security, while the second assumes that regional economic security is derived from national security. The use of the “quasi-state” concept presupposes an assessment of the level of economic security of the region based on the analysis of its most important spheres of activity. Given the high degree of differentiation of the most important socio-economic indicators, as well as the level of digitalization of the regions of the Russian Federation, it is advisable to proceed from the concept of a quasi-state region.

Strategic documents analysis in the information sphere allows us to trace the evolution of the “digital economy” concept. Thus, in the Strategy for the Development of the Information Society in the Russian Federation for 2017– 2030, the digital economy is considered as an economic activity in which digital data is a key factor in the production. So, the

digital economy is limited to segments of the productive sphere in this definition. At the same time, in a later document, in the programme “Digital economy of the Russian Federation”, the digital economy expands to other areas of socio-economic activity where digital data is a key factor of the production.

In defining the nature of the digital economy in scientific literature, one can also distinguish a narrow and broad interpretation of the concept. In the paper [4] within the framework of the narrow approach, the digital economy is defined as a set of socio-economic relations based on the use of electronic technologies and infrastructure, analysis and forecasting technologies with a view to optimize all stages of added value creation and, on this basis, to increase the level of socio-economic development of states. In the broad approach, the digital economy is seen as a virtual environment that complements our reality [5].

A similar point of view is shared by the authors of the paper [6] who, in a narrow sense, understand digitalization as the use of information in digital form, which makes it possible to increase production efficiency. In a broader sense, digitalization is seen as a vector of the world development, encompassing not only production but all spheres of social and economic relations.

Thus, while in the narrow approach the digital economy is seen as the introduction of information technology mainly in the productive sphere, in the broader context it is seen as the introduction of information technology into all spheres of activity of an individual and the society.

Digitalization is transforming the landscape of almost all forms of socio-economic relations. At the same time, along with new opportunities, previously unknown risks arise. Their neglect and lack of adequate counter-measures create threats to the national security. A fairly extensive list of risks and threats is presented in the program “Digital Economy of the Russian Federation”. The paper focuses on information and technological threats. The Strategy for Economic Security of the Russian Federation until 2030 also highlights the lag in the digital economy technologies development and introduction as a threat. This position is largely due to the state of the technological base of the digital economy, which is primarily determined by the level of the electronic industry development. Herewith, at present, technological superiority belongs to only three companies in the world (INTEL, Samsung and TSMC (Taiwan Semiconductor Manufacturing Company) [7]. Thus, in the policy documents in the economic security field, the main attention is paid to technological risks and threats.

Scientific literature also analyses technological threats. These include the lag of domestic technologies for the production of electronic components and the high level of dependence of the domestic industry on foreign information technologies [8]. At the same time, scientific literature presents a wider range of risks and threats to the digital transformation of the economy. The problem of analysing and systematizing them is therefore topical. In the paper [9], economic security risks in the digital economy are divided into systemic, structural and sectoral. Systemic risks and threats relate to the economy as a whole, or to its large sectors. These include dependence on foreign digital technologies and hardware components, as well as the problem of “digital inequality”. Structural risks are associated with the transformation of various markets, and

sectoral risks are associated with the transformation of economic and social sectors.

In a number of cases, risks of enterprises and individuals are also identified. The first group includes industrial espionage, hacker attacks, as well as insufficient digital technologies capacity and competent personnel, and the second group includes theft and personal data manipulation.

As a systemic risk, the paper [10] notes the inconsistency of certain policy types: digitalization, industrial, scientific and technical, technological, financial, regional, etc. For example, the digital transformation of the economy is carried out in the context of a continuing high dependence on imports of equipment and other types of products for the introduction of digital technologies. A similar point of view is also presented in the paper [11]. Systemic risk, according to the author, is due to the underestimation of the real economy role in the digital economy. The first priority for Russia is the transition from the resource-based economy to the manufacturing economy, and then to the digital economy. The stage of industry, microelectronics, computing development should precede the stage of transition to the digital economy.

Political, financial, economic, legal, technological, social risks and personality risks are presented in the paper [12].

The risk of information manipulating is classified as political; financial and economic risks include dangerous imbalance in assessing the real state of affairs in the economy; legal risks are legal uncertainty of the liability of the subjects of legal relations in the digital economy; technological risks are borrowed technologies, services, software; social risks include loss of human value as a producing unit; personality risks include deindividuation. The increasing dependence of individuals on technology should also be considered as threats to individuals [13]. This dependence gradually deprives the individual of his freedom, which has a negative impact on the competitiveness and economic security of the country.

It should be noted that there is a wide variety of approaches to the classification of risks and threats in scientific literature. For example, the paper [14] presents operational, financial, regulatory, organizational and technological risks. Among the most significant are the risks associated with the personal data protection, the increase in unemployment, the risk of the disappearance of certain professions and industries and the disruption of the level of well-being of the population.

The key factor of the digital economy is its communication aspect, which ensures the exchange of knowledge and technologies. This, however, poses the following risks [15]:

- economic agents dependence on the Internet,
- education system lag from the digital economy needs,
- digital inequality,
- oligopolization in the information market,
- companies’ gaining significant advantages over consumers through the use of modern big data analysis technologies,
- cybercrime growth,
- risks during data processing, storage and transmission.

II. THE RESEARCH METHODOLOGY

The study focuses on risks and threats to economic security in the digital transformation of the economy and its impact on the state of the main areas of activity. Research methods include analysis of planning documents as well as domestic and foreign literature on economic security issues. The systematization of the authors' points of view in scientific literature allowed for the classification of risks in the digital transformation of the economy. On the basis of a comprehensive analysis of regional strategic documents, the stages of digital transformation of regional economies and the current risks and threats of digital transformation have been highlighted.

III. KEY OUTCOMES

The economy digital transformation is a cause of a wide variety of risks and threats. Building an effective risk management mechanism necessitates their systematization and classification. We propose to use the object of unfavourable factors influence, as well as the nature of this influence, as the main classification features. In relation to the object, one can distinguish systemic, structural, sectoral risks, risks of enterprises and risks of individuals (Table 1). Systemic risks and threats relate to the economy as a whole, and structural risks relate to the major markets.

TABLE I. CLASSIFICATION OF ECONOMIC SECURITY RISKS

Type	Risk nature
Systemic	<ul style="list-style-type: none"> - foreign digital technologies dependence; - domestic electronic components; - digital inequalities in the territorial and social dimensions; - incoherence of individual types of policies: digital, industrial, scientific and technological, technological, financial and credit, regional, etc.
Structural	risks of labour market transformation, educational services, financial services, etc.
Industry risk	<ul style="list-style-type: none"> - digital transformation of economic and social sectoral risks; - individual industries disappearance risks
Risks of socio-economic development of the regions	<ul style="list-style-type: none"> - job cuts in the basic sectors of the regional economy: industry, agriculture and transport; - risks of different levels of regional information infrastructure development
Enterprise risks	<ul style="list-style-type: none"> - corporate data theft, industrial espionage, hacker attacks; - lack of digital technology, competent human resources, etc.
Personality risks	<ul style="list-style-type: none"> - identity theft and manipulation; - loss of identity.

By the nature of the impact on the object, the risks are divided into political, financial and economic, legal, social, technological and communicational (Table 2).

TABLE II. CLASSIFICATION OF ECONOMIC SECURITY RISKS

Type	Risk nature
political	information manipulation
economic and financial risks	dangerous imbalance emergence in the assessment of the real state of the economy
legal risks	legal uncertainty of liability of subjects of legal relations in the digital economy
social risks	<ul style="list-style-type: none"> - loss of human value as a producing unit, - unemployment growth, - risks of the disappearance of certain professions - increase in the wealth gap

technological	borrowed technologies, services, software
communication	economic agents dependence on the Internet.

When analyzing the risks and threats to the regional economy, it is necessary to take into account all the types of risks considered. At the same time, special attention should be paid to the risks of socio-economic development of regions caused by digitalization processes.

These include [16, 17]:

- job cuts in the basic sectors of the regional economy: industry, agriculture and transport;
- lack of digital literacy among the population, which hampers the effective use of digital technologies;
- different levels of regional information infrastructure development;
- uneven distribution of certain social benefits;
- digital inequality in the context of social groups due to low income, lack of education, lack of necessary skills, as well as physical disabilities due to old age, etc.

In terms of the impact on the socio-economic development of the region, the greatest risks are the social risks associated with rising unemployment, widening income gaps and increasing poverty. For example, the International Economic Forum estimates that approximately twice as many jobs will be created by 2030 than eliminated by digitization [18]. At the same time, these processes are not likely to coincide territorially. The processes of robotics are likely to affect primarily developing countries and regions with a high proportion of manufacturing. On the other hand, the developed countries will create favourable conditions for the creation of new jobs in the ICT sector.

This discrepancy also occurs in Russia: the risks are highest in the regions where agriculture and manufacturing have a significant share of the economy. While advanced high-tech companies are mostly established in large urban agglomerations dominated by the service sector [19]. It should be taken into account, that the decline in employment in the traditional sectors of the economy is forcing workers into the shadow economy. The consequence is a decrease in income and an increase in the level of social protection [20].

Job cuts resulting from the automation of the production and use of robots carry both direct risks from the mass layoffs of workers and indirect risks from the decline in the aggregate income of the society and the aggregate demand contraction [21]. Depressed demand erodes incentives to invest, leading to deterioration in economic dynamism and overall social welfare [22].

At the same time, the impact of the digitalization processes in deteriorating economy on different income groups varies considerably. For the relatively wealthy strata, increased digitalization reduces the risk of poverty and social exclusion [23]. For the relatively poor strata, however, the level of digitalization is likely to be negligible.

Social risks are also caused by the workers' skills inadequacy to meet labour market requirements [24]. Human capital is the driver of economic growth and digital economy development. The development of knowledge-intensive

technologies, technological processes automation and the active use of robots significantly reduce the need for specialists with medium-level skills. This increases the need for highly qualified professionals with universal competencies, including digital, cognitive, social and behavioural skills [25].

Thus, in addition to the social risks associated with rising unemployment, in the digital economy, priority must be given to managing the human risks that arise from the incompatibility of workers' competencies with the requirements of the new economy. The level of this risk type depends significantly on the fact that most enterprises have a system for upgrading the skills of employees.

In this connection, it is a matter of urgency to increase the number of competitive specialists with relevant competencies. In order to achieve this goal, it is necessary to combine the efforts of state bodies, the educational system, social actors and the population.

Thus, in addition to the undeniable benefits, above all, the technical, organizational, as well as the economic ones, digital economy will bring with it the risks of rising unemployment, social stratification, increasing poverty, labour market segmentation and the growing wage gap between different categories of workers [26]. In this context, the regions should respond to the challenges of digitalization.

In order to systematize the economy digital transformation presented in the regional strategic documents, we have analysed the planning documents of the constituent entities of the Federation of the Central and Northwest Districts. As a result of our research, we have identified two stages of the economy digital transformation reflection.

The strategies adopted between 2010 and 2014 focus on:

- providing consumers with the access to the state and municipal services online on the Internet (the Murmansk, Belgorod, Voronezh, Oryol and Kostroma regions);
- Internet portal creation on investment activities in the region (the Kaliningrad, Belgorod, Vladimir, Oryol and Pskov regions).

Less attention has been paid to:

- new information and communication technologies introduction in the work of libraries (the Belgorod, Bryansk and Pskov regions);
- tourism potential promotion on the Internet (the Ivanovo and Belgorod regions).

The following unique directions of digital transformation are also presented in many regions:

- Internet portal “Accessible Environment” creation (Urban Infrastructure Navigator) (the Yaroslavl region);
- the region image building as a promising place to work and live through specialized Internet sites (the Bryansk region);
- publication on the Internet portal of the information about territorial clusters of the region and the activities of the Centre for cluster development of the region (the Vladimir region).

Thus, in the strategic documents of the regions, adopted in the period 2010–2014, the main attention is paid to the information aspect of the digital economy, i.e. ICTs were mainly used to intake, process and provide information upon the request of users. However, the documents of this period have already identified a number of ways in which digital opportunities can be used to improve the efficiency of the market economy, namely:

- development of new elements of trade infrastructure, including various forms of trade: electronic exchanges, Internet shops, distance selling (the Kostroma region);
- stimulation of the IT industry development (the Voronezh region).

Let us further consider further the directions of digital transformation of regional economies presented in the strategic documents adopted after 2014. Virtually all regions attach great importance to citizens training in the digital economy and to the training of competent personnel for the digital economy.

In the documents relating to this period, the most complete matters on digital transformation are presented in the Tambov region and in Saint Petersburg.

The Tambov region has identified the following areas:

- digital budgeting (education, health, state and municipal administration);
- -formation of IT industry promotion
- The following tools for the digital economy have also been identified in the region:
 - involvement of Tambov IT companies in the digitalization of the regional industry and in the fulfilment of the orders of large state-owned corporations;
 - creation of an innovative "IT Park" to accommodate regional IT companies;
 - organization of electronic platforms system for suppliers and distributors on the Internet;
 - the agro-industrial complex digitalization.

The Strategy for social and economic development of Saint Petersburg up to 2035 focuses on the technological aspects of the digital transformation of the economy. The objective of the document is to develop domestic information technologies that can bring about digital transformation in priority sectors of the economy and the social sphere.

The Saint Petersburg strategy also envisages the digital platform creation to support the production and marketing activities of small and medium-sized enterprises as a digital transformation tool.

Thus, whereas in the Tambov region the sectoral approach to the digital transformation of the economy is predominant, in Saint Petersburg the technological approach prevails, i.e. the priority is given to the development of information technologies, which can bring about the digital transformation of the leading sectors of the region's economy.

The difference between the industries digital transformation second phase lies in the transition from the information services delivery to the use of information technology to improve production efficiency.

With regard to risks, the regional strategy documents focus on the following possible hazards not directly related to the digital economy:

- deterioration of macroeconomic conditions in the economy;
- difficulty to attract foreign investment in the light of the current foreign economic and foreign policy situation;
- expansion of foreign sanctions against Russian companies;
- increase in tariffs on services of natural monopolies;
- decrease in entrepreneurial activity;
- preservation of a high degree of dependence of the region's economy on certain industrial sectors;
- decreasing effective demand;
- reducing the supply and increasing the cost of financial and investment resources;
- environmental threats.

The risks posed by the digital transformation of the economy have received far less attention. For example, the risk of unemployment caused by the introduction of modern technologies for the digitalization and robotization of production is mentioned only in the documents of the Republic of Karelia. In the Murmansk region Strategy, unemployment risks are associated with an increase in flexible forms of employment. Outsourcing and remote work schemes, which are rapidly developing in the digital economy, make it possible to attract labour from other regions, which does not require special costs in the form of “northern allowances”, payment for transport and social benefits.

At the same time, most regions state a low unemployment rate and predict its further decline. In the Strategy of the Novgorod region, it is assumed that in the long term, the economy's demand for labour will increase, as a result, a steady trend will be formed to reduce the level of unemployment, which by 2035 may decrease to 3.8 % of the labour force.

At that, the regions pay considerable attention to the personnel risks caused by the lack of «digital» competences of employees. These risks are reflected in documents of the Vologda, Murmansk, Novgorod, Belgorod, Voronezh, Lipetsk regions, and St. Petersburg. The risks posed by digital inequality are presented in the strategies of the Republic of Karelia, the Vladimir, Lipetsk, Oryol and Tambov regions. In addition, in regional strategic documents, certain attention is paid to the following types of risk: risks of increasing poverty (the Vologda, Novgorod, Vladimir regions), criminalization of the Internet (the Vologda region), increasing differentiation of the population by income and wages (the Vologda region), information security (the Vologda and Vladimir regions).

IV. CONCLUSION

So, we have considered the risks and threats to regional economic security posed by the processes of digitization. In scientific literature, the social risks associated with rising unemployment, widening income gaps and increasing poverty, as well as human capital risks have been highlighted as the most relevant to the regional level. At the same time, macroeconomic and environmental risks are given priority in the strategies of the RF constituent entities. With regard to the risks associated with digitalization processes, the main emphasis is on personnel risks and risks due to digital inequality.

REFERENCES

- [1] T.I. Tohirov, “Management of economic security of the region” [“Upravlenie ekonomicheskoy bezopasnost'ju regiona”], State and Municipal Management. Scholar Notes [Gosudarstvennoe i municipal'noe upravlenie, Uchenye zapiski SKAGS], 2013, vol. 4, pp 189-194. (In Russ.).
- [2] E.A. Kuklina and O.V. Starikova, “Sustainable Development of Regions of Russia and Regional Security in the Context of New Normal” [“Ustojchivoe razvitie regionov Rossii i regional'naja bezopasnost' v kontekste Neshh Normal”], Bulletin of Ural Federal University. Series Economics and Management [Vestnik UrFU. Serija jekonomika i upravlenie], 2016, vol. 15(3), pp. 401-419. (In Russ.).
- [3] M.A. Nikolaev and M.Ju Mahotaeva, “Economic security of the region: a systematic approach” [“Jekonomicheskaja bezopasnost' regiona: sistematizacija podhodov”], in: A.V. Babkin (Ed.), Industrial policy in the digital economy: problems and prospects: proceedings of a scientific and practical conference with international participation [Promyshlennaja politika v cifrovoj jekonomike: problemy i perspektivy: trudy nauchno-prakticheskoy konferencii s mezhduнародnym uchastiem], 2017, pp. 289-296. (In Russ.).
- [4] L.K. Gurieva, A. Borodin and A.K. Berkaeva, “Management Model Transformation in the Digital Economy”, in Proceedings of the 1st International Scientific Conference Modern Management Trends and the Digital Economy: from Regional Development to Global Economic Growth (MTDE 2019), 2019, vol. 81, pp. 383-387. (In Russ.).
- [5] O.A. Truhina and I.V. Smirnova, “Formation of the digital economy in Russia: essence, features, development problems” [“Formirovanie cifrovoj jekonomiki v Rossii: sushhnost', osobennosti, problemy razvitiya”], Innovative Development of Economy Journal [Innovacionnoe razvitie jekonomiki], 2018, vol. 4(46), pp. 117-124. (In Russ.).
- [6] V.G. Khalin and G.V. Chernova, Digitalization and Its Impact on the Russian Economy and Society: Advantages, Challenges, Threats and Risks [“Cifrovizacija i ee vlijanie na rossijskuju jekonomiku i obshhestvo: preimushhestva, vyzovy, ugrozy i riski”], Administrative Consulting [Upravlenscheskoe konsul'tirovanie], 2018, vol. 10, pp. 46-63. (In Russ.).
- [7] V. Barinov, M. Kulapov and R.O. Grazhina. “Challenges of Russian Economy Digitalization in the Context of Socio-economic Development”, Montenegrin Journal of Economics, 2020, vol. 16(3), pp. 17-30. (In Russ.).
- [8] N.M. Kalinina, “Economic security of the region: essence, threats and security measures” [“Jekonomicheskaja bezopasnost' regiona: sushhnost', ugrozy i mery obespechenija”], STJeZh, 2010, vol. 10. (In Russ.). Retrieved from <https://cyberleninka.ru/article/n/ekonomicheskaja-bezopasnost-regiona-suschnost-ugrozy-i-mery-obespecheniya>
- [9] E.V. Popov and K.A. Semyachkov, Problems of economic security for digital society in the context of globalization [“Problemy jekonomicheskoy bezopasnosti cifrovogo obshhestva v uslovijah globalizacii”], Regional Economy [Jekonomika regiona], 2018, vol. 14(4), pp. 1088-1101. (In Russ.).
- [10] L. Belousova, S. Markina and L. Afanasjeva. “Improvement of Industrial Policy in Russia in the Conditions of Key Calls for Industrial Development and Economic Security”, in Proceedings of the 33rd

- International-Business-Information-Management-Association Conference, 2019, pp. 2253-2263. (In Russ.).
- [11] R.P. Koshkin, "Digital economy is a new stage in the development of the information society in Russia" ["Cifrovaja jekonomika – novyj jetap razvitija informacionnogo obshhestva v Rossii"], Strategic priorities [Strategicheskie prioritety], 2017, vol. 3(15), pp. 4-15. (In Russ.).
- [12] T.O. Grafova and A.F. Shapovalov, "Risks and threats of economic safety in digital economy" ["Riski i ugrozy jekonomicheskoy bezopasnosti v cifrovoj jekonomike"], Azimuth of scientific research: economics and administration [Azimut nauchnyh issledovanij: jekonomika i upravlenie], 2020, vol. 9(30), pp. 382-386. (In Russ.). DOI: <https://doi.org/10.26140/anie-2020-0901-0096>
- [13] O.V. Korisheva, "Analysis of risks and threats to the competitiveness of the Russian Federation in the aspect of digitalization of the economy and economic security" ["Analiz riskov i ugroz konkurentosposobnosti Rossijskoj Federacii v aspekte cifrovizacii jekonomiki i jekonomicheskoy bezopasnosti"], Topical issues of Economics [Aktual'nye voprosy jekonomiki], 2018, pp. 78-85. (In Russ.).
- [14] M.Yu. Lev and Yu.G. Leshhenko, "The digital economy: towards a strategy for the future in the context of economic security" ["Cifrovaja jekonomika: na puti k strategii budushhego v kontekste obespechenija jekonomicheskoy bezopasnosti"], Russian Journal of Innovation Economics [Voprosy innovacionnoj jekonomiki], 2020, vol. 10(1), pp. 25-44. (In Russ.). DOI: <https://doi.org/10.18334/vinec.10.1.100646>
- [15] M.A. Eskindarov, V. V. Maslennikov and O.V. Maslennikov, "Risks and chances of the digital economy in Russia" ["Riski i shansy cifrovoj jekonomiki v Rossii"], Finance: theory and practice [Finansy: teorija i praktika], 2019, vol. 23(5), pp. 6-17. (In Russ.). DOI: <https://doi.org/10.26794/2587-5671-2018-23-5-6-17>
- [16] V.V. Pechatkin, "Formation and development of the digital economy in russia as a strategic priority for the development of territories in the context of pandemics" ["Formirovanie i razvitie cifrovoj jekonomiki v Rossii kak strategicheskij prioritet razvitija territorij v usloviyah pandemij"], Russian Journal of Innovation Economics [Voprosy innovacionnoj jekonomiki], 2020, vol. 10(2), pp. 837-848. (In Russ.). DOI: <https://doi.org/10.18334/vinec.10.2.110187>
- [17] I.Je. Zhadan, "Social risks in the digital economy" ["Social'nye riski v cifrovoj jekonomike"], Humanitarian scientific journal [Gumanitarnyj nauchnyj zhurnal], 2018, vol. 1(1), pp. 4. (In Russ.).
- [18] ShhEF (2018) The Future of Jobs Report 2018, Geneva: Shhorld Economic Forum, Retrieved from <https://shhshhshh.shheforum.org/reports/the-futureof-jobs-report-2018>
- [19] S. Zemtsov, V. Barinova and R. Semenova, "The Risks of Digitalization and the Adaptation of Regional Labor Markets in Russia", Foresight and STI Governance, 2019, vol. 13(2), pp. 84-96. (In Russ.). DOI: <https://doi.org/10.17323/2500-2597.2019.2.84.96>
- [20] I. Tiutiunyk, T. Vasylieva and Y. Bilan, "The Impact of Industry 4.0 on the Level of Shadoshh Employment", in Proceedings of the International Scientific Conference on The Impact of Industry 4.0 on Job Creation, Trencianske Teplice, SLOVAKIA, 2020, pp. 405-413.
- [21] N. Trusova, "Government socio-economic policy under the digital economy in the foreign countries and Russia". ECONOMICANNALS-XXI, 2019, vol. 180(11-12), pp. 88-96. (In Russ.).
- [22] I.A. Strelkova, "Digital economy: new opportunities and threats for the development of the world economy" ["Cifrovaja jekonomika: novye vozmozhnosti i ugrozy dlja razvitija mirovogo hozjajstva"], Economy. Taxes. Right [Jekonomika. Nalogi. Pravo], 2018, vol. 11(2), pp. 18-26. (In Russ.). DOI: <https://doi.org/10.26794/1999-849X-2018-11-2-18-26>
- [23] A. Kshhilinski, O. Vyshnevskiy and H. Dzshhigol, "Digitalization of the EU Economies and People at Risk of Poverty or Social Eclusion", Journal of risk and financial management, 2020, vol. 13(7), pp. 1-14.
- [24] M.K. Chernjakov, M.M. Chernjakova and K.Ch. Akberov, "Dynamic model of social risks in the digital economy", in Proceedings of the 1st International Scientific Conference Modern Management Trends and the Digital Economy: from Regional Development to Global Economic Groshhth (MTDE 2019), 2019, vol. 81, pp. 371-376. (In Russ.).
- [25] I. Manakhova, E. Levchenko and V. Bekher. "Jualitjof Human Resources and Personnel Security Risk Management in Digital Economy". QUALITY-ACCESS TO SUCCESS, 2020, vol. 21(175), pp. 74-79. (In Russ.).
- [26] J. Rymarczyk, "Technologies, Opportunities and Challenges of the Industrial Revolution 4.0: Theoretical Considerations", Entrepreneurial Business and Economics Revieshh, 2020, vol. 8(1), pp. 185-198.