

Ensuring Sustainable Employment of Personnel in the Context of Digitalization of the Economy

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Abstract

Aim. In the article is conducted a study aimed at identifying areas for ensuring sustainable employment in the context of the digitalization of the economy.

Methodology. The authors carried out a critical review of the literature on the issues under study and identified the main participants that influence the provision of sustainable employment, such as government authorities, educational institutions, employers and staff of the organization. In the course of the study, an online survey was conducted, which included representatives of the real sector of the economy, government officials, students, university professors and temporarily unemployed citizens from different regions of the country, enterprises and organizations of different sizes and forms of ownership, as well as spheres of activity.

Results. The opinion of the respondents was revealed on a number of important issues related to the modern transformation of the economy and the formation of new labor relationships that affect the sustainable employment of the country's population. Demand, from the point of view of employment and importance for society as a whole, according to the respondents, will be those who have and form the necessary and appropriate "digital competencies". It was also found that the digital economy will lead to a change in the value attitudes of employers, staff and the organization as a whole. At the same time, it is necessary to preserve a humanistic approach to personnel, emphasizing the advantages of a person in interaction with information technologies.

Conclusions. *The digitalization of the economy will change the requirements for professions, which will entail changes in the organizational culture and value attitudes of all participants, influencing the provision of sustainable employment.*

Value. *The results of the study will help both employers and educational institutions to identify new approaches to training and personnel management in order to ensure sustainable employment.*

Key-words: Sustainable Employment, Digital Economy, Employers, Personnel, Educational Institutions, Value System, State.

1. Introduction

In different countries of the world, a transition is currently underway from an industrial to a post-industrial model of the economy, as well as from a post-industrial to an information model, which is due to the different levels of readiness of countries to change in various aspects, such as: the development of human and social capital, the development of globalization, growth innovations, ensuring a high level of economic freedom, stimulating entrepreneurial activity, etc.

In this regard, the qualification requirements for a number of professions and employment conditions have changed significantly, new trends in the development of labor relations have been formed that meet the requirements of a modern innovative economy. The emergence of new flexible and remote forms of employment, in comparison with standard conditions, does not imply observance of the labor and social rights of workers to a standardized working week, regularly paid wages, labor protection, vacation and social insurance.

On July 28, 2017, by order of the Government of the Russian Federation, the program "Digital Economy of the Russian Federation" was approved, according to which the state intends to implement a digital change in the economy, as well as the social sphere of the Russian Federation by 2024.

Thus, at present, global socio-economic changes are taking place, defining transformations in many areas of society, including in the field of social and labor relations. A new system of regulation of sustainable employment of the population is being formed, which is fundamentally different from the one that existed in the conditions of the industrial and post-industrial economy.

According to Vendramin P. and his colleagues (Vendramin, Valenduc, Molinié, Volkoff, Ajzen, 2012), sustainable work demonstrates three important characteristics: "biocompatibility", which means that the work is adapted to the functional properties of the human body and its evolution with age; "ergonomics", in which effective work strategies are developed; and "social compatibility",

which promotes self-realization not only in the workplace, but also in the family and social spheres, as well as “the ability to control your life path”.

Comparative analysis of the evolution of intercountry differences in the quality of jobs showed that the distribution of jobs in terms of their quality and advancement on the socio-economic ladder is often ignored. However, Goos M. (Goos, Manning, & Salomons, 2009) argues that the increasing polarization between good and bad jobs is one of the most important issues that must also be addressed while maintaining job sustainability.

The main areas of ensuring sustainable employment in the context of the digitalization of the economy include: government support for sustainable employment; development of the education system; retraining of personnel in organizations; socially responsible actions of business in relation to personnel and, as a consequence, the formation of new value attitudes.

The aim of the study is to identify areas for ensuring sustainable employment in the context of the digitalization of the economy.

2. References Review

The state, in the context of the ongoing changes, is assigned a decisive role. Only the state is able to effectively coordinate the actions of the population, government bodies, non-state enterprises, as well as public organizations (labor market participants) in the field of labor and employment. It is the state that possesses the necessary resources and is endowed with the power to develop an institutional policy, that is, to create a system of mechanisms and rules that will allow all labor market participants to focus their efforts on maintaining sustainable employment of the country's population.

In modern realities, state regulation of sustainable employment should be considered as a rather complicated complex, which includes a number of economic, administrative, legislative, organizational and other measures of influence and support.

The basis of state regulation of employment is formed by such legislative acts of the highest jurisdiction as the Constitution of the Russian Federation, the Labor Code of the Russian Federation, as well as the Federal Law of 19.04.1991 № 1042-1 "On Employment of the Population in the Russian Federation."

The Ministry of Labor and Social Protection of the Russian Federation directly develops and implements the state policy in the field of employment, and the functions of control and supervision are carried out by the Federal Service for Labor and Employment, subordinate to the said ministry

and directly ensuring the implementation of the State Program "Promotion of Employment of the Population". The latter includes three subprograms ("Active employment policy and social support for unemployed citizens"; "External labor migration"; "Development of labor market institutions") and is focused on creating legal, economic and institutional conditions conducive to the effective development of the labor market. This program also includes activities envisaged in the framework of the national projects "Labor productivity and employment support", "Demography", "Education" and "Digital economy".

Foreign experience of state regulation of employment of the population and its features are presented in the works of Swepston L. (Swepston, 2007), Almeida R. and Pedro C. (Almeida R., Pedro C., 2009), Wagner U., Gutnik V. (Wagner U., Gutnik V., 2003), Ferreiro J. Gomez C. (Jesus Ferreiro, Carmen Gomez, 2021) and also in the materials of the International Labor Office (International Labor Office, 2010).

One of the most important areas of ensuring sustainable employment in the context of the digitalization of the economy is the transformation of the vocational education system. The study of this problem is given the attention of both domestic and foreign scientists. In the articles of T. Nikulina V., Starchenko E. B. (Nikulina, Starchenko, 2018), Guzhina G. N., Ezhkova V. G. (Guzhina, Ezhkova, 2019), Digilina O.B., Teslenko I.B. (Digilina, Teslenko, 2019), Kozlova E.I. (Kozlova, 2020) substantiates the need for the formation of new competencies related to digital literacy, the ability to create and apply content through digital technologies, including computer programming skills, search, information exchange and new communications. The fact that the digitalization of the economy determines the formation of a number of new skills and abilities among workers is also written by foreign authors Halten C. (Hulten, 2017), Ziemann V. (Ziemann, 2017), Dettling L. (Dettling, 2017), Frey K., Osborne M. (Frey, Osborne, 2017), Jagannathan S., Ra S., Maclean R. (Jagannathan, Ra, Maclean, 2019).

A socially oriented non-financial development institution conducted a study on the readiness of the education system for the digital transformation of the economy in terms of such parameters as 1) human capital, 2) digital infrastructure, 3) government policy and regulation, 4) the use of digital technologies, 5) the impact of digital technologies on the education system. This study showed a weak readiness (2 points out of 5) of the domestic education system for the digitalization of the economy in terms of 1,3 and 4 parameters.

The article by Volobueva T.B. (Volobueva, 2020) reveals the current digital aspects of modern education in the world, such as: visualization, personification, diversification, gamification,

quick access to information and the use of cloud technologies, etc. The author characterizes the main competencies of graduates in accordance with the requirements of modern society.

The change in the system of personnel training for the digital economy puts forward new requirements for the personal qualities and professional competencies of teachers. This problem was reflected in the work of Ponomareva S. V., Serebryansky D. I. and Dubrovina E. P. (Ponomareva, Serebryansky, Dubrovina, 2018).

In the work of Senokosova O.V. (Senokosova, 2018), the problem of inconsistency of human resources with the structure of jobs is noted. To ensure a balance between them, the author proposes the creation of a mechanism that should contain tools for the formation of integration links between the labor market and the educational services market, as well as methods of strengthening integration ties between educational institutions and the real sector of the economy.

Thus, the transformation of the education system will allow maintaining sustainable employment in the context of the digitalization of the economy through the formation of new competencies for both teachers and students.

In the context of the digitalization of the economy, the role of business social responsibility to its employees is increasing. To the internal organizational responsibility Smoglenko O.N. (Smoglenko, 2018) attributes:

- Labor safety.
- Stability of wages.
- Maintaining a decent wage level.
- Additional medical and social insurance for employees.
- Development of the creative potential of employees through training programs and professional development programs.
- Providing assistance in crisis situations.

The most important priority for socially responsible employers in the context of the inevitable digital transformation of their business models should be the retention of employees of the organization, providing them with appropriate retraining and advanced training.

Analysis of the effects of the introduction of breakthrough technologies by leading corporations shows that the main consequence of automation and robotization is not the destruction of jobs, but their renewal. Organizations and their HR departments will have to switch to a model of flexible career paths, taking into account the possible transition of personnel from one functional block to another due to the automation of their functionality in part or in full (Gokhberg, 2019).

Note that within the framework of the relationship between the employer and the staff, sustainable human resource management is perceived differently. Ehnert I. (Ehnert, 2011) in his study highlights several of these interpretations. So, for some companies, sustainable human resource management refers in general to sustainable development, that is, to the desire for companies to acquire an economic, social and environmental balance. Other companies emphasize their social responsibility to employees in the process of managing organizational and labor relations. According to third companies, achieving sustainability requires that organizational relationships, roles and responsibilities are sustainable. In the area of increasing the company's efficiency, the sustainability of human resources management includes not only the traditional criteria of financial efficiency, but the well-being and health of employees, and social legitimacy.

Gollan (2005) in his study focuses on the key role of high-engagement management practices, including high-quality communication and consultation between management and employees, in ensuring organizational performance and sustainable results for both employers and employees.

As noted by Lee K., Kusbit D., Metsky E., Dabbish L. (Lee, Kusbit, Metsky, Dabbish, 2015), Möhlmann M. and Zalmanson L. (Möhlmann, Zalmanson, 2017), the participation of business in providing conditions for decent labor and employment in modern conditions is associated primarily with the implementation of social dialogue between employers and employees. Today it is necessary to discuss the problems of formation and practical implementation, monitoring and evaluation of national programs of decent work and employment. The authors emphasize the need for an inclusive (taking into account the specifics of real socio-economic conditions at the local and regional levels) and cross-border nature of a new social dialogue between company management and employees.

Fomicheva T.V. and Kataeva V.I. (Fomicheva, Kataeva, 2019) in the article "The values of Russians in the context of the digitalization of the Russian economy" note that due to the digitalization of the economy, the traditional socio-cultural, moral values of Russians are replaced by instinctive ones.

With the change of the paradigm of society under the influence of digitalization, there is a transformation of values, which can be caused by many factors, including adaptation to innovative and digital technologies, the emergence of new professions, etc. These problems are considered in the report of the National Research University Higher School of Economics "What is the digital economy? Trends, Competencies, Measurement" (Gokhberg, 2019).

Petrovskaya E.N. (Petrovskaya, 2020) notes that according to some data, 47% of jobs that exist in 2018 may disappear in the United States by 2033 under the influence of robotization. For China, this share can be expressed as 77% (according to the calculations of the World Bank

specialists). Sklyar M., Kudryavtseva K. (Sklyar, Kudryavtseva, 2019), Ngwenyama O., Henriksen H., Hardt D. (Ngwenyama, Henriksen, Hardt, 2021), Manyika J. (Manyika, 2019), Nottebohm (Nottebohm, 2012), Carson (2019), Matilla-Santander N., Gonzalez-Marron A., Martin-Sanchez H., Lydon-Moyano K., Cartania-Huyeso A., Martínez-Sánchez X (Matilla-Santander, González-Marrón, Martín-Sánchez, Lidón-Moyano, Cartanyà-Hueso, Martínez-Sánchez, 2020) point out the danger of similar socio-economic risks of the era of digitalization in their works. This is also stated in the reports of the World Bank (World Bank, 2016), the European Commission (European Commission, 2018), the Organization for Economic Cooperation and Development (OECD, 2018) and other organizations that have conducted relevant studies.

Most researchers note that the following categories of the population are most at risk: able-bodied population employed in temporary work; part-time population with casual (non-systematic) earnings; freelance and contingent labor workers; migrants; trainees and students. As a social consequence of the introduction of the digital economy, one can call the "complex dehumanization of human relations" due to the competition for jobs between robots and people "(Fomicheva, Kataeva, 2019).

However, we do not fully agree with these statements and adhere to the point of view of scientists of the Massachusetts Institute of Technology (Nikolaidis, Ramakrishnan, Gu, Shah, 2015), who in their research in the field of human-robot interaction introduced the term "superhuman", meaning superhuman performance, due to the close interaction of man with machines. At the same time, retraining of personnel should be aimed at developing skills that emphasize the advantages of a person in interaction with information technologies. Organizations need to retain talented people and provide them with satisfaction, security and confidence in the future.

3. Research Methods

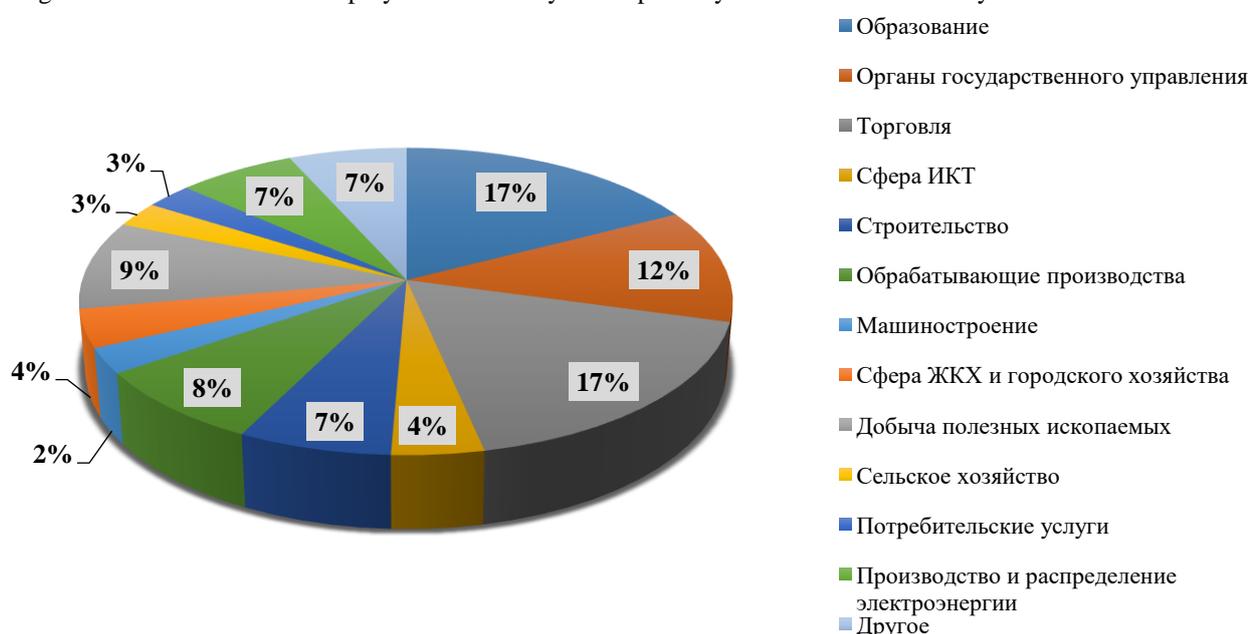
In order to study the directions of ensuring sustainable employment in the context of the digitalization of the economy, the authors of the article developed a questionnaire consisting of several blocks of questions. The blocks were systematized in such a way as to cover all categories of respondents, including representatives of the real sector of the economy, civil servants, students, university professors and temporarily unemployed citizens. The survey was conducted using google-forms, which made it possible to cover a large number of respondents (more than 200 people) from different regions of the country, enterprises and organizations of different sizes and forms of ownership, as well as fields of activity.

The study used traditional methods of content analysis, comparison and comparison, as well as a map of the problematic field of interaction between participants, influencing the provision of sustainable employment in the digital economy.

The use of these methods made it possible to identify problem areas and substantiate the directions for ensuring sustainable employment in the context of the digitalization of the economy.

The survey involved respondents, of whom 90.1% are employed. They have different organizational status, from a manager to an ordinary employee, and represent different spheres of the economy (Fig. 1).

Figure 1 - The Structure of Employment of Survey Participants by Sectors of the Economy of the Russian Federation



Among the respondents, 58% are males and 42% females. Almost all participants in the survey of working age, established by the legislation of the Russian Federation, their distribution by age categories is presented as follows: 16-25 years old (27.2%), 26-35 years old (30.9%), 36-45 years old (16.0%), 46-55 years old (22.2%), 56-65 years old (1.2%), over 65 years old (2.5%). More than half of the respondents (58.1%) are young people under the age of 35, who showed the greatest interest in the research and took an active part in the survey. Almost all respondents have higher education.

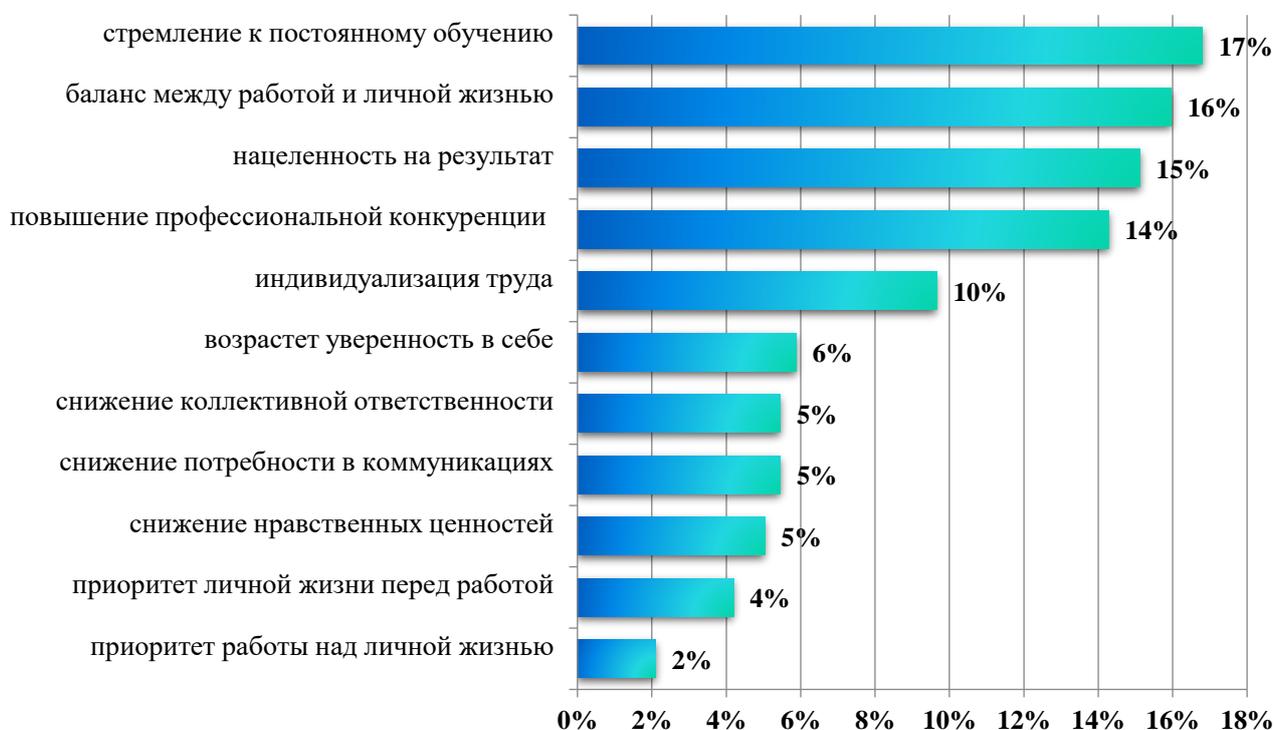
In the course of the study, the opinion of the respondents was revealed on a number of important issues related to the modern transformation of the economy and the formation of new labor

relations that affect the sustainable employment of the country's population. Among such questions, should be attributed:

1. How obvious is the advent of the digital economy era for you, and what changes will it cause for individuals and society as a whole?
2. Does the digitalization of the economy have an impact on the employment of the population, and if so, what is the impact?
3. What is the role of labor market participants (state and local authorities, educational structures, employers, the person himself, etc.) in the formation of sustainable employment?
4. What are the conditions for ensuring sustainable employment in a changing economic environment?

Answering questions regarding the ongoing changes and the onset of the digital economy era, most of the survey participants agreed that this is an objective reality, and the organizations in which they work, in one way or another, use digital technologies. This circumstance was referred to by 91.8% of the respondents. Most of them noted the unconditional impact of these changes on the value attitudes and behavior of participants in labor processes. In terms of what changes will be caused by the widespread use of digital technologies, the opinions of the respondents were divided (Figure 2).

Figure 2 - Structure of Respondents' Answers Regarding the Impact of Digitalization on Values and the Role of a Person



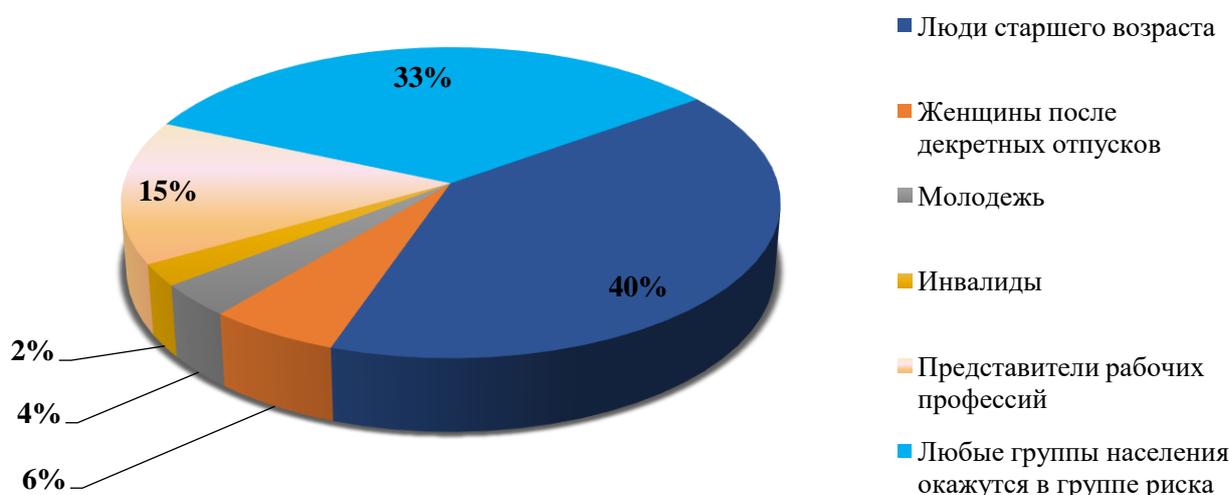
As for the nature of changes in the system of social values under the influence of the digital economy, the respondents' answers were distributed as follows:

- will lead to devaluation of a person in comparison with technologies, automata and robots (23.5% of the number of respondents);
- will increase the value of a person in comparison with technology, automata and robots (6.2% of the number of respondents);
- will add value only to those people who have the ability to work in the digital sphere (39.5% of the respondents);
- digitalization will provide an opportunity for development for each person, his intellect and talent (30.9% of the number of respondents).

Consequently, the respondents express an opinion about a certain transformation of their place and role in society. Demand, from the point of view of employment and importance for society as a whole, will be those who have and form the necessary and appropriate “digital competencies”.

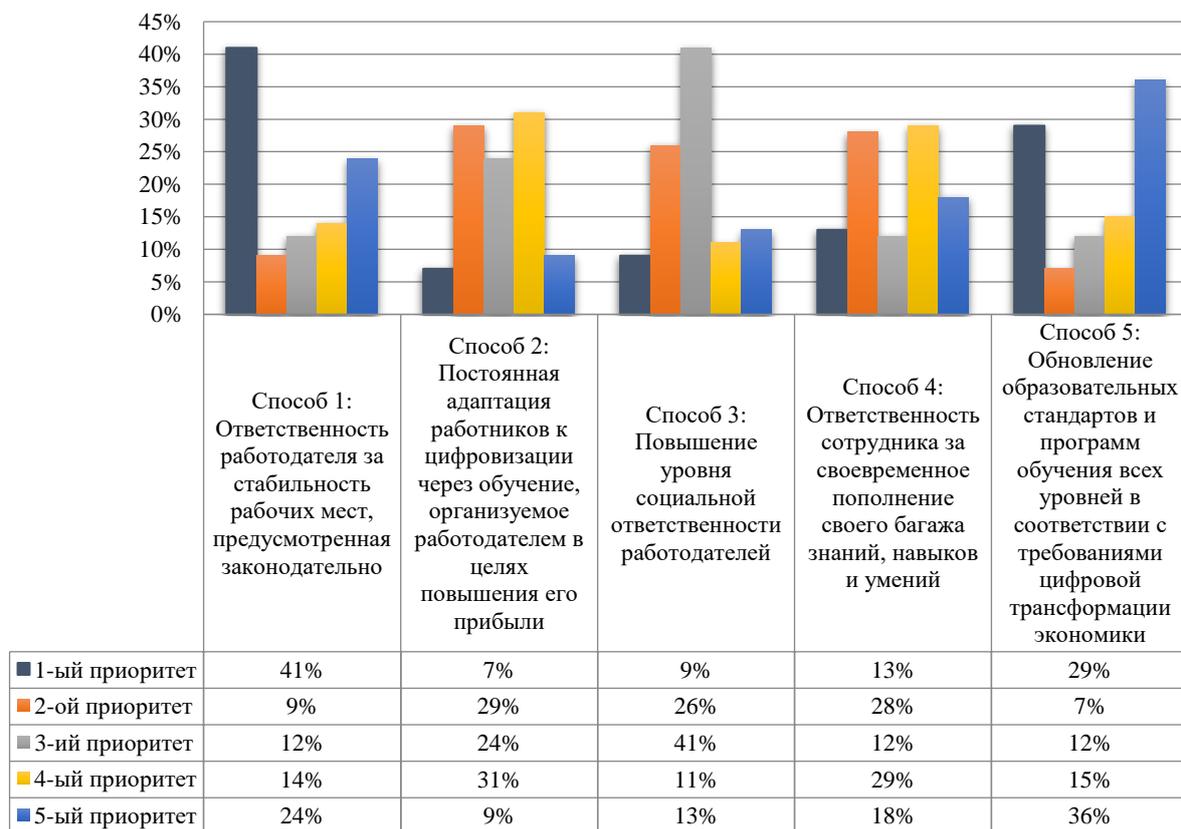
According to the responses received, the majority of survey participants are inclined to believe that the use of digital technologies will contribute to the professional and personal development of a person. Unfortunately, as stated by a part of the respondents (23.5%), the chances of doing this are different for everyone, and many will be at risk and will be left without work. Among those who may be in this group are older people, representatives of blue-collar occupations, women after maternity leave, and young people (Fig. 3).

Figure 3 - Opinions of Respondents Regarding the Population Groups Most Vulnerable in Terms of Employment with the Further Development of Digitalization



To the question of the questionnaire "What do you think will contribute more to increasing the sustainability of employment in the context of the increasing introduction of digital technologies?" The respondents' opinions were distributed as follows (Fig. 4):

Figure 4 - Opinions of Respondents Regarding Ways to Increase the Sustainability of Employment in the Context of the Digitalization of the Economy



Thus, from the point of view of the respondents, the most priority way to increase the sustainability of employment in the context of the digital transformation of the economy (41% of respondents) is the creation of legislatively enshrined mechanisms that form the employer's responsibility for the stability of jobs. The second place was divided between the methods proposed in the questionnaire (2-4), of which the most preferable was the constant adaptation of employees to digitalization through training organized by the employer (29%). As the third priority among the approaches to increasing the sustainability of employment (41%), the respondents identified the strengthening of the social responsibility of employers. The next most important ways were identified training and adaptation to digitalization, initiated by both employers (31%) and employees themselves (29%). At the same time, the respondents put the updating of state educational standards

and training programs at all levels of training, bringing them in line with the requirements of digital transformation of the economy in the fifth position.

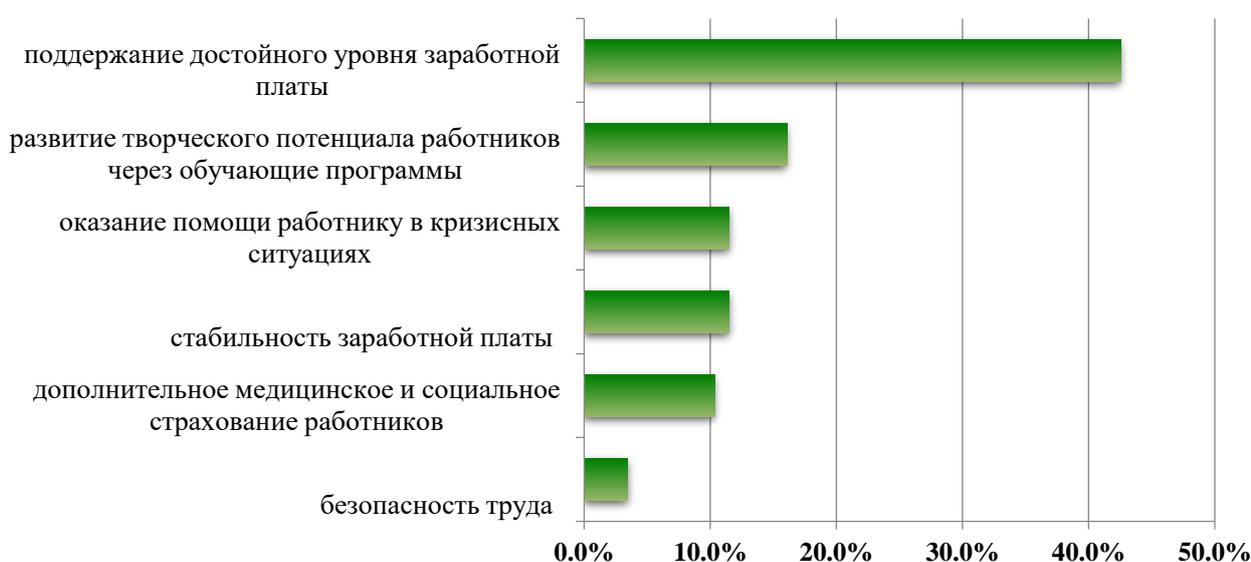
It is obvious that the role of each participant in contributing to the provision of sustainable employment for the population is different. This is indicated by all participants in the survey. Thus, most of them note the important role of the state in addressing sustainable employment issues.

In their opinion, the main tools that various state institutions should use to solve this problem are:

- Legal regulation of employment (18.2% of respondents).
- Financial support for employers who maintain and create workplaces (31.8% of respondents).
- Comprehensive state support for people actively looking for work (27.3% of respondents).
- Monitoring and updating state educational standards (12.5% of respondents).
- Development of the system of additional education (9.1% of respondents).
- Other tools to support sustainable employment (1.1% of respondents).

The respondents assign a significant role in ensuring sustainable employment to employers. It is no coincidence that 31.8% of them agreed that it is necessary to support employers who maintain and create new workplaces. In this regard, business must be socially responsible. The social responsibility of business in the field of sustainable employment, according to the respondents, should be achieved as follows (Fig. 5).

Figure 5 - The Main Directions of the Implementation of Social Responsibility of Business for the Purpose of Sustainable Employment of the Population

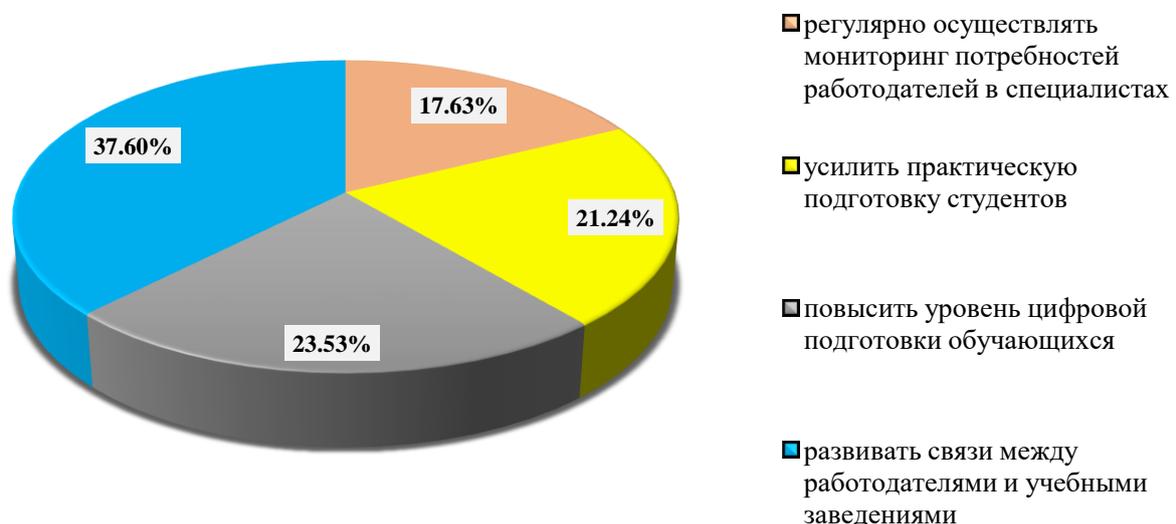


In ensuring sustainable employment of the population, a large role is assigned to educational institutions that provide vocational training, retraining and advanced training of workers. The respondents confirmed the opinion that the education system of the Russian Federation should contribute to the digital transformation of the economy and society as a whole. The respondents assessed its readiness for such transformations as follows:

- completely ready (1.2%).
- partially ready (37%).
- significant changes are required (35.8%).
- not ready (16.0%).
- find it difficult to answer (9.9%).

Undoubtedly is the fact that the vocational education system of the Russian Federation has big tasks for its development and adaptation to the changing conditions associated with the digitalization of the economy. To the question of the questionnaire "What changes need to be made in the education system for its faster adaptation to the requirements of the labor market?" respondents answered as follows (Fig. 6):

Figure 6 - The Main Directions of Development of the Vocational Education System in Order to Ensure Sustainable Employment of the Population

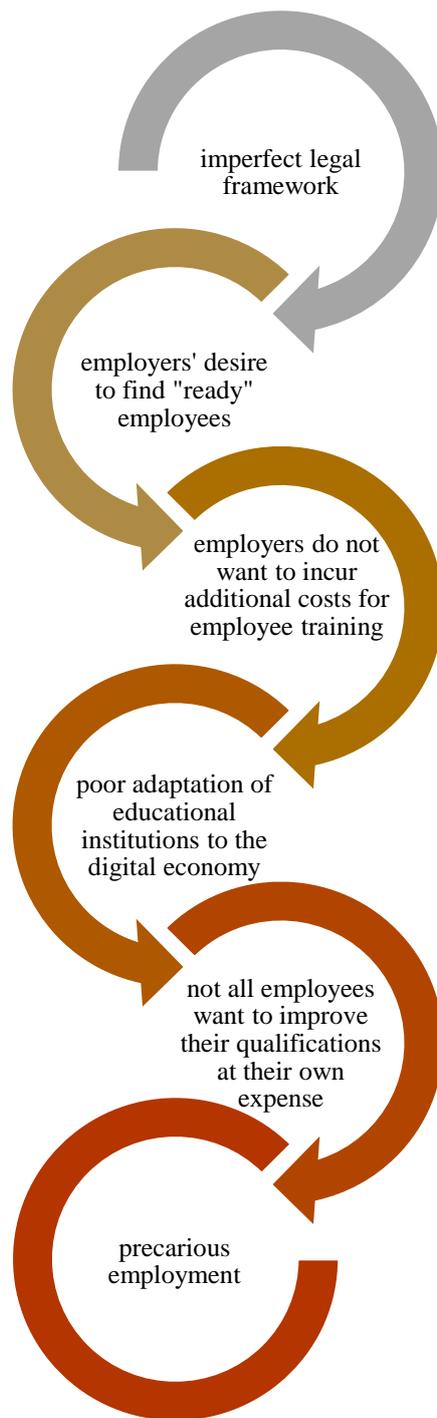


It should be noted that all respondents agreed that digital skills training for employment and sustainable employment is essential. At the same time, 69.1% of the total number of respondents are

ready to undergo training at their own expense, the rest agree to undergo training at the expense of the employer or the state (14.8% and 16.0%, respectively).

The study made it possible to build a map of the problematic field of interaction between the participants, influencing the provision of sustainable employment in the digital economy (Fig. 7).

Figure 7 - Map of the Problem Area of Participants Providing Sustainable Employment



The existing weaknesses in the activities of each entity that influence the formation of sustainable employment can ultimately lead to the development of precarious employment. The main task in the era of digitalization of the economy is to ensure sustainable employment through the interaction of all participants in this process and the leveling of their weaknesses.

The changes that will need to be implemented in order to ensure sustainable employment will inevitably lead to transformation and the formation of new values and organizational cultures. Despite the digitalization of all spheres of activity, a human, as a person, should remain in the center of attention of all participants who influence the provision of sustainable employment.

4. Conclusions

Thus, conducted research has shown that digitalization of the economy is an objective reality. This circumstance entails significant changes in the forms and conditions of employment of the population, and most of the survey participants are ready for the upcoming changes. These changes provide, on the one hand, a chance for professional and personal development and the formation of individual sustainable employment, and on the other hand, they carry certain risks in the implementation of the presented opportunities.

The digital transformation of the economy also leads to a change in organizational culture, the core of which is employees who possess competencies both in the field of digitalization and teamwork that contributes to the development of human relations. All this will allow maintaining a humanistic approach to personnel and increasing the sustainable employment of organizations.

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References

- Almeida, R., Pedro, C. (2009) Enforcement of Labor Regulation and Firm Size. *Journal of Comparative Economics*, 37, 28-46.
- Carson, E. (2019) Robots Could Replace Humans in a Quarter of US Jobs by 2030 *CNET*. Retrieved from <https://www.cnet.com/news/robots-could-replace-humans-in-a-quarter-of-us-jobsby-2030>
- Dettling, L.J. (2017) Broadband in the labor market: the impact of residential high-speed internet on married women's labor force participation. *ILR Review*, 70(2), 451-482.

- Digilina, O.B., Teslenko, I.B. (2019). Transformation of the labor market in the context of digitalization. *RGGU Bulletin. Series "Economy. Control. Right"*, 4(2), 166-180.
- Ehnert, I. (2011) Sustainability and HRM: A Model and Suggestions for Future Research. In Wilkinson A., Townsend K. (eds) *The Future of Employment Relations* (215–237). Palgrave Macmillan, London. Retrieved from https://doi.org/10.1057/9780230349421_12
- European Commission (2018) Threats and opportunities from automation and robotisation. - Retrieved from https://ec.europa.eu/knowledge4policy/foresight/topic/changing-nature-work/new-technologiesautomationwork-developments_en
- Ferreiro, J., Gomez, C. (2021) Employment protection, employment and unemployment rates in European Union countries during the Great Recession, *Journal of Economic Policy Reform*, Retrieved from <https://doi.org/10.1080/17487870.2020.1855175>
- Fomicheva, T. V., Katayeva, V. I. (2019) Russian Values in the Context of Digitalization of the Russian Economy. *The standard of living of the population of the regions of Russia* 2 (212), 80-84
- Frey, C.B., Osborne, M.A. (2017) The Future of Employment: How Susceptible are Jobs to Computerisation? *Technological Forecasting and Social Change*, 114, 254–280.
- Gokhberg, L. M. (red.) (2019) What is the digital economy? Trends, competencies, measurement. *report to COP Apr. int. scientific. conf. on the problems of economic and social development, Moscow, 1 – 12 Apr. 2019.; Nat. issled. University Higher School of Economics. Moscow: Ed. House of the Higher School of Economics*, 82.
- Gollan, P. (2005). High Involvement Management and Human Resource Sustainability: The Challenges and Possibilities. *Asia Pacific Journal of Human Resources*, 43 (1), 18–3.
- Goos, M., Manning, A., & Salomons, A. (2009). Job polarization in Europe. *American Economic Review*, 99(2), 58–63.
- Guzhina, G.N., Ezhkova, V.G. (2019). Labor market transformation under the influence of the digital economy. *Innovation and investment*, (9), 56-59.
- Hulten, Ch. (2017) The Importance of Education and Skill Development for Economic Growth in the Information Era. *NBER Working Paper. WP-2414*. Cambridge. Retrieved from <https://www.nber.org/papers/w24141.pdf>
- International Labour Office (2010) Youth Employment Programme. *Geneva: ILO*, P. 18-19. https://www.ilo.org/wcmsp5/groups/public/-ed_emp/documents/publication/wcms_154365.pdf
- Jagannathan, S., Ra, S., Maclean, R. (2019) Dominant recent trends impacting on jobs and labor markets. *An Overview, International Journal of Training Research* 17(1), 1-11. Retrieved from DOI: 10.1080/14480220.2019.1641292
- Kozlova, E.I. (2020) The impact of digitalization on labor market. *Chelyabinsk State University Bulletin*, 10 (444), 70-77.
- Lee, K., Kusbit, D., Metsky, E., Dabbish, L. (2015) Working with machines: The impact of algorithmic and data-driven management on human workers. In *Proceedings of the Association for Computing Machinery (ACM) Conference on Human Factors in Computing Systems* (1603-1612), Seoul.
- Manyika, J., Lund, S., Chui, M., Bughin, J., Woetzel, J., Batra, P., Ko, R. and Sanghvi, S., (2017) Jobs Lost, Jobs Gained: Workforce Transitions in a Time of Automation. McKinsey Global Institute.

Retrieved from <https://www.mckinsey.com/featured-insights/future-ofwork/jobs-lost-jobs-gained-what-the-future-ofwork-willmean-for-jobs-skills-and-wages>

Matilla-Santander, N., González-Marrón, A., Martín-Sánchez, J.C., Lidón-Moyano, C., Cartanyà-Hueso, A., Martínez-Sánchez J.M (2020) Precarious employment and health-related outcomes in the European Union: a cross-sectional study. *Critical Public Health*, 30(4), 429-440, Retrieved from DOI: 10.1080/09581596.2019.1587385

Möhlmann, M., Zalmanson, L. (2017) Hands on the Wheel: Navigating Algorithmic Management and Uber Drivers' Autonomy Completed. In *Proceedings of the International Conference on Information Systems, Seoul, South Korea*. Retrieved from https://www.researchgate.net/publication/319965259_Hands_on_the_wheel_Navigating_algorithmic_management_and_Uber_drivers'_autonomy

Ngwenyama, O., Henriksen, H.Z., Hardt D. (2021) Public management challenges in the digital risk society: A Critical Analysis of the Public Debate on Implementation of the Danish *NemID*, *European Journal of Information Systems*, Retrieved from DOI: 10.1080/0960085X.2021.1907234

Nikolaidis, S., Ramakrishnan, R., Gu, K., J Shah, J. (2015) Efficient model learning from joint-action demonstrations for human-robot collaborative tasks. *IEEE: 10th ACM/IEEE International Conference on Human-Robot Interaction (HRI)*. 189–196

Nikulina, T. V., Starchenko, Ye. B. (2018). Informatization and digitalization of education: concepts, technologies, management. *Pedagogical education in Russia*. 8. 107-113.

Nottebohm O. [et al.] (2012) Online and Upcoming: The Internet's Impact on Aspiring Countries. *Palo Alto: McKinsey & Company*. Retrieved from <http://www.mckinsey.com/industries/high-tech/ourinsights/impactof-the-internet-on-aspiring-countries>

OECD (2018) Economic scenarios to 2060 illustrate the long-run benefits of structural reforms. *Organisation for Economic Co-operation and Development*. Retrieved from <http://www.oecd.org/newsroom/oecd-economic-scenarios-to-2060-illustrate-the-long-runbenefits-of-structural-reforms.htm>

Petrovskaya, N. Ye. (2020). Impact of new technologies and robotization on employment in the United States. *Upravleniye*. 8 (2), 81-90.

Ponomareva, S. V., Serebryanskiy, D. I., Dubrovina, Ye. P. (2018) Training of highly qualified personnel in industrial companies in the context of the introduction of the digital economy. *V sb.: A. V. Babkin (red) Innovative clusters of the digital economy: drivers of development: proceedings of a scientific and practical conference with international participation*. (522-526) SPb.: Publishing house of Polytechnic. un-ta.

Senokosova, O. V. Clustering of industry and education in the digital economy. *In collection: A.V. Babkin (ed.) Innovative clusters of the digital economy: drivers of development: proceedings of a scientific-practical conference with international participation*. (527-532) SPb.: Publishing house of Polytechnic. un-that.

Sklyar, M.A., Kudryavtseva, K.V. (2019). Digitalization: trends, benefits and risks. *Economic revival of Russia*, 3(61), 103-114.

Smoglenko, O.N. (2018). Social responsibility of business and its role in the development of the company. *Modern scientific research and innovation: electron. scientific. zhurn., 1*. URL: <https://web.snauka.ru/issues/2018/01/85718> (data obrashcheniya: 21.05.2021).

Swepston, L. (2007) *International Labour Law. Comparative Labour Law and Industrial Relations in Industrialized Market Economies. IX-th ed. Kluwer Law International.*

Vagner, U., Gutnik, V. (2003) Labor market regulation: German experience and Russian problems. *Problems of theory and practice of management, 1*, 69-74

Vendramin, P., Valenduc, G., Molinié, A. F., Volkoff, S., Ajzen, M., & Léonard, E. (2012). *Sustainable work and the ageing workforce* (11-12). Luxembourg: Eurofound.

Volobuyeva, T. B. (2020) Digital vectors of education development. V sb. *Transformation of the meanings of education in the context of digitalization of society (Krasnodar, February 27-28, 2020) of the All-Russian Scientific and Practical Conference. (7-14). M.: World of Science.*

World Bank (2016) *Digital Dividends: World Development Report 2016*. Washington, DC. Retrieved from <http://www.worldbank.org/en/publication/wdr2016>

Ziemann, V. (2017) Inclusive labour Markets in the digital era: The case of Austria. *OECD Economics Department Working Papers, WP-17-143*. OECD Publishing, Paris. Retrieved from <http://dx.doi.org/10.1787/c2331c20-en>

tation: Möhlmann, M. and Zalmanson, L. (2017): Hands on the wheel: Navigating algorithmic management and Uber drivers'.

autonomy, proceedings of the International Conference on Information Systems (ICIS 2017), December 10-13, Seoul, South Korea.

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öhlmann, M. and Zalmanson, L. (2017): Hands on the wheel: Navigating algorithmic management and Uber drivers'. autonomy, *proceedings of the International Conference on Information Systems (ICIS 2017)*, December 10-13, Seoul, South Korea.