

Transformation of the Vocational Training System in the Conditions of Digitalization of The Labor Market

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Abstract. This article presents the main trends of changes in the labor market related to the process of digitalization. The main problems related to the issues of labor productivity growth, job cuts and ensuring effective demand are also considered. In the article, we propose to consider the process of digitalization as a way to encourage creativity in the workplace, taking into account the fact that in order to establish a modern economic order, during which services become the main product, and digital platforms and ecosystems are the main actors in the global economy. Particular attention is paid to changes in the labor market during the period of mass digitalization. When labor market and wage reforms began in the world, it was hard to imagine that the labor market would change so quickly in a few decades. A comparative analysis of the state of the labor market in Russia was carried out, which made it possible to determine the phases and types of reproduction of labor potential “narrowed”, “expanded”, “simple”, depending on the age and structure of education. The segment of the “black hole” in specialists with competencies in the digital economy is highlighted. The directions of creating an ecosystem of continuing education are proposed, which allow forming digital competencies and supporting the reproduction of labor potential during the life cycle of society. Digitization of the economy has been a global trend in the last decade and more significantly over the past five years.

1 Introduction

Digitalization today has penetrated into all spheres of life of any state. The special sensitivity of digitalization is manifested in the change in the forms of social production processes aimed at transforming human labor into intellectual labor, replacing it with computer technologies and the use of machine learning. These challenges have revealed a number of problems, primarily related to the training of a workforce capable of adapting to new knowledge, skills, and competencies that are in demand in the modern labor market.

The high dynamism of the applied technology for the production of goods and the provision of services sets the task of continuous improvement of professional skills. These

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reasons require reformatting the organization of the system of reproduction of labor potential. An extensive review of domestic and foreign literature allowed the authors to identify the hypothesis of the development of the reproduction of labor potential, based on a combination of the principles of socialization, value orientations and self-affirmation. This task is realized through the formation of an educational space focused on continuing professional education. Ensuring the training of specialists capable of performing labor functions is based on the competencies of the digital economy, as well as on the possibility of self-development of society throughout the entire life cycle [1].

The construction of theoretical principles is based on the creation of hypotheses in the process of researching the labor market. The hypotheses are based on the methods of systematization and structuring of research results on the theory of labor potential development and reproduction [2]. The model of reproduction of labor potential at certain stages of the life cycle of society is based on the theories of P. Janet, the model of the main characteristics of the personality of S. Buhler and professional development. The model identifies qualitative changes in the labor market, expanded the stages of vocational training, which have unity throughout the life of society, providing an integral effect of the reproduction of labor potential. The result of the study is the construction of an ecosystem for the reproduction of the labor potential of society during the life cycle, based on a systematic approach [4, p. 147].

The digitalization of the economy has changed business models, made adjustments to practical activities, contributed to the emergence of new types of production of goods and services, and the formation of an open labor market. "Creativity" today can be interpreted as a new term that means the workplace is being transformed by digitalization, as a result of which monotonous work processes are replaced by intellectually intensive operations, elements of art and unique high-performance activities. Obviously, digitalization is changing the structure of the labor market, affecting employment and income distribution.

2 Research Methodology

Over the past ten years, digital technologies have penetrated an increasing number of sectors of the global economy. For example, more than 40% of EU workers have been involved in changing and replacing the technology they use at work [3]. Structural changes in the labor market in Europe are closely related to the very high demand for advanced digital skills in the coming years. The development of the post-COVID economy is already showing positive signs of recovery. For the first time since the beginning of the year, industrial production in Russia showed an increase of 3.9% [5, p. 54]. More than 9 million new jobs are expected to be created in 2023 and unemployment will be kept at 6%.

Another important limiting component is the level of digitalization of the economy. For example, in accordance with the definition of the digital economy provided by the OECD methodology, the digital economy forms about 6% of the country's GDP [6]. Officials have set a goal of increasing the share of GDP derived from the digital economy to 50% by 2030. Some authors point to possible solutions to the problem of laying off workers and reducing the number of jobs by increasing the income of such citizens from other sources.

The staged model allows for a comprehensive study of the professional development of society throughout life [7]. The identified problems of professional evolution at each stage of the life cycle: the formation, distribution and use of labor potential are directions for improving continuous professional education in the context of platformization and digitalization of the economy. The ecosystem of continuous training in the reproduction of labor potential throughout the life cycle of society is designed taking into account individual motives, needs and opportunities for professional development [8]. It is necessary to create conditions for vocational training, adaptation to new requirements,

processes, types of work, development of self-employment initiatives [9]. The dynamism and unity of the ecosystem will make it possible to reproduce the demand for labor potential at the regional level, meeting the needs of society, science, technology, education and business, and society will harmoniously integrate into the processes of the digital economic paradigm.

3 Results and Discussions

There is still no common definition of “digital skills” or “digital competencies”. Different terms are used in the literature, sometimes with different interpretations, with a general understanding that they refer to skills in the use of information and communication technologies. These include “computer literacy”, “ICT literacy”, “digital literacy”, “digital competencies”, “ICT skills”, “e-skills”, “technological literacy”, “media literacy” and “information literacy” [10]. The first definition was “knowledge in the field of ICT”. As information and communication technologies have become more complex and new applications have been developed, broader definitions have emerged that cover cognitive, behavioral, social and emotional skills. Over time, a number of overlapping (sometimes partial) definitions have emerged, such as “computer literacy”, “Internet literacy”, “media literacy” and “digital literacy” [6, p. 99].

Analyzing the literature, three main categories of digital competencies can be distinguished, which are used in various models for measuring or developing digital competencies. These three categories apply to different types of abilities and users:

- a) basic digital skills, which, in essence, are digital literacy for both personal and work use;
- b) digital skills related to employment, which include basic skills to add the necessary knowledge to the workplace, mainly the use of ICT applications;
- c) digital competencies for ICT professions, which, in addition to the first two categories, also include specialized knowledge required in the ICT sector, as well as an innovation component and the ability to develop new digital solutions, products or services.

The European Commission has grouped digital skills into categories [11]: digital skills for all – developing digital skills that enable all citizens to be active in our digital society; digital skills for the workforce – developing digital skills for the digital economy, such as upskilling and retraining workers and job seekers, and providing career advice and guidance; digital skills for ICT professionals – developing high-level digital skills for ICT professionals in all sectors of industry; digital skills in education – transforming the teaching and learning of digital skills from a lifelong learning perspective, including teacher training; and Digital Skills for Girls and Women – Taking action to develop digital skills for women and girls.

A thorough review of the academic literature was carried out, as well as government policies and programs, labor market research reports; data analysis, study of political, economic, socio-cultural and technological factors. Factors that determine the development of digital skills for the labor market in the European Union, i.e. “PEST-analysis”.

The digitization of the economy has become a global trend over the past decade and more importantly over the past 5 years. Digital transformation is structurally changing the labor market and the nature of work. There are concerns that these changes could affect employment conditions, income levels and distribution. Over the past 10 years, a number of programs and policy initiatives have been launched to accelerate the digitization of the economy, only to realize that the labor market lacks digital skills and competencies.

In 2018, the Grand Coalition for Digital Jobs was launched, a multinational and multi-sectoral platform including public and private organizations, companies and educational service providers to develop digital competencies and search for vacancies in the field of

information and communication technologies. In 2019, a strategy for creating a digital one was developed by European specialists, which highlights the need to create, in particular, an inclusive digital society in which citizens have the digital skills they need to take advantage of the opportunities offered by the online environment, but especially to increase their chances of obtaining work.

In the same year, the Digital Competence Platform 2.02 was launched, which defines five key components of citizens' digital competence: 1) information literacy; 2) communication and cooperation; 3) creation of digital content; 4) security; and 5) problem solving. These are the basic digital skills that people need to have in order to use the Internet personally. These skills are also increasingly required in the workplace as general "default" competencies [3, p. 376].

In 2019, the European Commission also launched the New Skills Development Programme. This agenda highlights the importance of developing human capital through the development of digital competencies, starting with primary education. It also highlights the need for lifelong learning to prevent lagging behind in terms of skills, especially digital skills that are constantly evolving. The Competence Guarantee was introduced in the new competency program to help low-skilled adults achieve a minimum level of numeracy and digital literacy and gain access to a secondary level of education. Also in 2020, the European Commission published a communication on the digitization of European industry.

Part of this paper is dedicated to digital skills, with a focus on preparing human capital for the digital transformation of the workforce. Digitalization is fundamentally changing the labor market and the nature of work, with a significant impact on employment, income levels and their distribution. The Qualifications Framework is a pan-European reference system designed to make qualifications that are more readable and understandable across countries and systems useful, for example, in cases of professional mobility across Europe. Employment – digital skills of the workforce as a whole The last decade has pushed digital technologies and digitization into an increasing number of sectors of the economy, not only in Europe but also globally. Digitization is global in nature and affects the world economy accordingly, albeit with different rhythms of change.

Many of the employees of various European firms believe that, within the next five years, their skills and application at work will probably no longer be relevant. The share of workers in this situation varies depending on the sector of the economy in which they work: 29% in the ICT sector, 24% in the financial and insurance sectors, and 23% in the professional, scientific and technical services sector. According to the same study, about 10% of jobs in the EU are at very high risk of being misplaced by employees' digital skills. The most affected EU countries are Estonia (23%), Slovenia (21%) and the Czech Republic (19%).

Prospects for the digital labor market in the EU It has been estimated that structural changes in the labor market in Europe are closely related to the very high demand for advanced digital skills in the coming years. There is a strong correlation between the expected number of jobs that will increase in the next ten years and the need for advanced digital skills to apply in these occupations. In a survey, a 2020 study by Cedefop found that 71% of EU employees mention that they need basic and intermediate ICT/digital skills to do their jobs, and 14% of workers say they need advanced digital skills at work. Among the EU28 countries, Denmark, Ireland and Sweden are those where more than 80% of the workforce needs basic digital skills for work, while in Greece, Cyprus and Romania this percentage is 60% [1, p. 171].

According to the World Bank (2020), the labor market in Europe is characterized by a strong polarization of digital competency needs, such that entire populations are virtually excluded from society and the digital economy. Thus, some categories of the European

workforce do not really need digital skills for work (56% of workers in simple professions, 25% of workers in the service and trade sectors, 33% of workers in agriculture and 29% in the hospitality and catering sector) . For these categories of workers, manual skills are much more important. This is due to the use (or lack thereof) of digital knowledge in society. If a person does not need digital skills in the workplace and does not use them often, it is unlikely that such skills are required for social activities. This can be explained, for example, by the relatively high percentage of the EU population with low digital literacy or insufficient Internet use. In particular, some EU populations, such as the elderly, low-skilled workers and some female workers, are not in jobs that require advanced digital skills.

To compensate for the exclusion of certain categories of citizens from the use of information and communication technologies and digital technologies, many EU countries have developed and implemented compensatory ICT education and training programs that actively promote digital inclusion and access to ICTs. However, these programs are mainly focused on the development of basic digital competencies, and recent research indicates that advanced digital skills, especially programming and coding, will soon become job requirements. Even now, employees who use advanced digital skills at work earn about 3.7% more hourly gains than those who use only basic digital skills.

The change in consumer attitudes is driven by factors such as ever higher expectations, more information and more choices. However, in addition to changing attitudes, banks should consider other factors when developing their digital strategy. For example, people's preference for online and digital activities is common worldwide. Moreover, the "Generation Y" (the so-called "digital natives") are now in the age of choice of financial service providers, and for them the digital interaction with the bank is a decisive factor.

Prospects for the digital labor market in the banking sector. Due to the emergence of new and invasive technologies, the nature of work in general and in the banking sector is changing. This change affects the number of employees needed, the type of skills needed to work in banks, and the banking career. In the banking industry, employment is becoming increasingly volatile. Most analysts expect the number of employees at any given firm to continue to decline. In the United States, the average tenure in 2020 for workers aged 25-34 was less than three years, compared with more than 10 years for workers in the 55-64 age group, according to the 2020 U.S. Bureau of Labor Statistics. Across Europe, length of stay at work varies by country, but even so between 2020 and 2021, the length of stay at work among millennials has tended to decrease.

It is much easier and faster for companies to interact with customers using ICT and digital technologies. In this way, companies send and receive email invitations that are suitable for automated processing, and they automatically link their business processes to those of their suppliers and customers. Eurostat data is incomplete, but it is clear from the available information that in 2020 the EU countries that sent e-invitations suitable for automated processes were Spain (32% of all businesses with more than 10 employees), Lithuania (24%) and Estonia (20%) (source: Eurostat). Financial services data were not available. Cloud computing services. More and more companies are using the Internet as a source of services or delocalized work [8, p. 106].

Companies can buy cloud computing services from shared servers or service providers such as email or office software (such as word processors, spreadsheets, etc.). Similarly, companies can use cloud computing to purchase corporate database hosting, file storage, financial or accounting software applications, customer relationship management software, and computing power to run their own enterprise software. According to Eurostat, in 2018, companies in Finland used cloud computing most intensively (65% of enterprises employing more than 10 people are not in the financial sector), followed by Sweden (57%), Denmark (56%), the Netherlands (48%) and Ireland (45%). The largest growth in the use

of cloud computing services by enterprises in the period from 2016 to 2018 was registered in Denmark and the Netherlands [7, p. 255].

Currently, data is collected from all possible sources. The challenge, in terms of skills and abilities, is how to analyze and interpret them all. Companies can collect and analyze big data from any data source, or they can analyze their own big data generated by smart devices and sensors, portable device geolocation, social media, or other sources [12].

Data analysis can be performed by the company's own employees and by an external service provider. Studies show that positions such as "Data Manager" or "Data Interpreter" are much needed, but in fact they are not enough. Case Study - Digital Skills for the Banking Sector. As for the banking sector, both McKinsey (US studies) and Cedefop (EU studies) show that digitalization will have a strong impact on the financial, banking and insurance sectors, not only in operations, but also mainly in their workforce.

Information and Communication Technologies (ICTs) are increasingly being used by organizations in Europe as part of their internal operational processes such as Radio Frequency Identification (RFID) technologies and software for enterprise resource planning (ERP). For example, RFID technologies are used to identify products after the sale or as part of the manufacturing and service delivery process, for personal identification and access control, for monitoring and controlling industrial production, for tracking supply chains and inventory, and for providing service information and asset management.

Enterprise resource planning software is used to share sales/purchasing information with other internal functional areas [13]. Other ICT-type technologies used by businesses are customer relationship management (CRM) to analyze customer information for marketing purposes and to collect, store and provide customer information to other business functions. At present, it is impossible to accurately assess the scope and consequences of digitalization for the entire European society. We are indeed facing a new industrial revolution that will fundamentally change the way we live and the composition of our workforce.

Considering that the digitalization of the economy has become a global trend over the past decade and, more importantly, over the past five years, the European Union recognizes that digitalization is changing the structure of the labor market, affecting employment and income distribution.

Over the past decade, the European Union has launched many programs and initiatives to encourage people to acquire the digital skills they need for both social and professional life. However, despite all efforts, according to data published by Eurostat, currently 44% of people do not have basic digital skills, while 37% of employees do not have digital skills that would help them at work [2, p. 121].

4 Conclusions

Over the past ten years, digital technologies have penetrated an increasing number of sectors of the European economy. As a result, in 2020, 43% of EU workers were involved in changing and replacing the technology they use at work (i.e. machines and IT systems). It is estimated that structural changes in the labor market in Europe are closely related to the very high demand for advanced digital skills in the coming years. There is a strong correlation between the anticipated number of jobs that will increase in the next ten years and the need for advanced digital skills in these occupations.

Digitalization will have a strong impact on the financial, banking and insurance sectors, not only in the operational area, but also mainly in relation to their workforce. Globally, banks are increasingly using IT and digital technologies to improve both operational efficiency and customer experience. In connection with the emergence of new and invasive technologies, the nature of work in general and in the banking sector is changing. This

change affects the number of workers that will be needed, the type of skills needed to work in banks, and the banking career.

References

1. O.B. Digilina, I.B. Teslenko, Transformation of the labor market in the context of digitalization, **4**, 166 (2019)
2. Digital economy: how the global labor market will change from 2018 to 2025
3. K. Marx, *Capital*, **1**, 376 (1995)
4. E. Brynjolfsson and A. McAfee, *The second era of machines: work, progress and prosperity in a time of brilliant technology*. Norton and company, 148 (2014)
5. D. A. L. Caldwell, The negative impact of the 4th industrial revolution on the workplace: towards a theoretical model of the entropic behavior of citizens in toxic organizations, **16 (15)**, 26 (2019)
6. M. Ford, *Rise of the robots. Technology and the threat of an unemployed future*. Basic books. 98 (2015)
7. C. B. Frey, M. A. Osborne, The future of employment: How susceptible are jobs to computerization? *Technological Forecast and Social Change*, **114**, 254 (2017)
8. V. S. Osipov, Rising unemployment in the cyber economy, **2**, 105 (2019)
9. A. S. Salamova, O. Dzhioeva, Green transformation of the global economy in the context of sustainable development, 152 (2023)
10. A. S. Salamova, Global networked economy as a factor for sustainable development, 03053 (2020)
11. S.Kh. Sulumov, Problems of the labor market in the conditions of digitalization of the economy, **7 (89)**, 206 (2022)
12. S.Kh. Sulumov, Features of research of the functioning of the labor market under the conditions of digital transformation, **90**, 223 (2022)
13. I.M. Podkolzina, I.V. Taranova, K.T. Paytaeva, S.V. Revunov, T.F. Abrosimova, Innovative approaches in financial support for regional economic security. 549 (2021)