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Ukrainian labor market in the transition to digitalization

Abstract

The *purpose* of the article is to study the transformations, consequences of automation, new vectors of development of state policy in the field of labor, etc. in the labor market of Ukraine. *Methodology*. The work uses such research methods as systematization and classification of theoretical approaches to the interpretation of the concept of "digital transformation", analysis and synthesis of the positive and negative impact of digital transformation on employment and the labor market, systematization of the main waves of the automation process and its impact on the labor market in the context of digitalization. The survey *results* showed that the formation of the digital economy is a leading trend in the modern world and a key factor in economic growth. Digitalization of society entails the following social consequences: 1) an increase in the number of people employed in the information sphere (producers, processors, distributors of information); 2) intellectualization of many types of work and, as a result, increased requirements for general education and vocational training; the emergence of completely new professions that require qualifications in the digital economy; 3) the extinction of existing professions (especially in connection with the robotization of many working professions and the introduction of artificial intelligence systems). Information technology and robotics have contributed to a radical change in the labor market. Young people are already facing the risk of losing their jobs due to automation. The redistribution of current tasks between people and machines is already happening in companies. Business and government should work together to help people learn how to use new technologies and reduce the negative impact of automation. *Practical implications*. The impact of digital technologies on various sectors of the economy will have a positive impact only if the state is actively involved in preventing the growth of problems in the labor market caused by digitalization. Thus, information systems will contribute to the transformation of educational and cultural institutions into serious information centers. *Value/originality*. The paper provides a justification for the strategic priorities of labor market regulation in terms of strengthening the country's competitive position in the transition to a digital economy.

Keywords

digitalization, labor market, employment, automation

JEL: R23, O15, O33

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DOI: <https://doi.org/10.30525/2500-946X/2022-3-6>**1 Introduction**

The rapid development of digitalization, which transforms the life of society in many aspects, has become a modern reality. These transformations have led to the formation of a new level of quality of life, when people's priorities are changing, the needs for self-realization and intellectual development through higher education, qualification and improvement of their own skills and competencies are becoming a priority. In the context of modern development, scientific knowledge has become a real driving force. This is manifested in scientific and technological progress, which expands human capabilities, develops new activities, reduces production time, etc.

The rapid development of technology has caused a deepening interest in the digital economy and has also influenced the development of the labor market. The digitization era has opened new horizons for the creation of new forms of employment as well as new forms of enterprises. This necessitates research on the significant transformations of the labor market caused by digitalization. Many domestic and foreign scholars have chosen this topic for their own research, including N. A. Azmuk, O. I. Bilyk, O. O. Gerasimenko, O. A. Grishnova, N. M. Dovhanyk, S. A. Dyatlova, S. P. Kalinina, V. I. Kyrylenko, A. M. Kolot, Yu. O. Chaliuk, R. Florid, D. Bell, A. Ross, J. Hawkins, K. Skinner. The impact of digitalization on employment and the labor market is the subject of research by the International Labor Organization,

the European Commission, the World Economic Forum and other international institutions.

Issues related to identifying trends in the transformation of the labor market in a digital society remain insufficiently covered. There is a need to justify the strategic priorities of labor market regulation from the standpoint of strengthening the country's competitive position during the transition to a digital economy.

The aim of the article is (a) to identify the key transformations in the labor market caused by the development of digital technologies, (b) to study the interpretation of the term "digital transformation", (c) to determine the positive and negative consequences of automation, (d) to analyze new vectors of development of state policy in the field of employment, (e) to study the relationship between the development of the digital economy and its impact on the formation of digital employment.

2 Digital transformation in the labor market

At the turn of the 20th and 21st centuries, revolutionary changes took place that (a) accelerated the development of scientific and technological progress and (b) created the conditions in which this progress could be carried out. It is about the emergence of the computer, then the Internet, the introduction of 3G/4G/5G communication standards.

This has increased the importance of digital technologies in increasing the competitiveness of national economies and their impact on the socio-economic stability of countries. Today it is impossible to imagine a comfortable existence without digital technologies. Digitalization of the economy creates the use of artificial intelligence (AI), robotics, cloud computing in the production process and increases the demand for workers with digital skills.

The public administration system, however, is not ready for such changes. The inconsistency of decisions and actions of the authorities at the legislative and executive levels leads to their isolation in the formation of strategies for digital, socio-economic, educational and professional development. The rapid pace of digitalization of management and production processes is increasing the imbalance between the development of the national labor market and the digital economy. The formation of the global digital segment of the labor market is accompanied by economic and social contradictions, which are especially acute in institutionally underdeveloped countries, such as Ukraine. This requires strengthening the orientation of state policy of socio-economic development towards ensuring a balance between the processes of transformation of the national labor market and the formation of a digital economy (Stolterman, 2004).

The transition to a digital economy is a natural process and requires modernization of the employ-

ment sphere. Digital technologies are accompanied by digital transformation, which completely changes the state of affairs in the world, including in the labor market. The COVID-19 pandemic has only accelerated these processes and acted as a catalyst. With most businesses and government organizations switching to remote work, employees had to adapt to the situation or master computer and digital technologies.

Digital transformation is the introduction of digital technologies in all types of business activities that require fundamental changes in operations and in the principles of creating new services and products, in culture and in modern technologies. Digital transformation is directly related to digital technologies and the digital economy. Other interpretations of the term "digital transformation" are given in Table 1.

In relation to digital transformation, countries today are divided into: post-industrial, industrial and agrarian countries. The former are characterized by the predominance of the service sector in the economy, where knowledge and information are becoming the main sources of economic growth. The latter are characterized by labor – in the literal sense of the word. Workers work on machines, farmers cultivate their territories in the field (Kyrylenko, 2020).

The consequences of the COVID-19 pandemic have proven that in conditions of isolation from each other, humanity can produce services and goods that will be in demand in the market. Digital technologies help to produce high-quality and valuable products. Of course, for some specialties, the issue of manual labor, or at least the coordination of industrial and agricultural activities, is relevant, but this issue will become less important than it was before the pandemic.

3 Labor market and automation

Computerization, robotics and new technologies bring to the fore not a person as the basis of labor potential, but other components. Robots and modern machines can better cope with their duties and perform their work faster and better (smart robots). For the employer, it is more profitable because there is no need to establish contact with machines to discuss various aspects. It is just necessary to monitor it and use it skillfully.

The demographic situation in the world shows that the population is constantly growing, and by 2030 its number will reach 8.5 billion people. In order to avoid the problem of unemployment and crime, the population must be employed. In the case when machines replace most of the human labor, it will not be profitable for the employer to pay wages to employees (their work will be completely replaced by robots), because they do practically nothing.

TABLE 1 Definition of the terms "Digital transformation"

Author / Source	Definition of the term
Digital transformation	
What is digital business transformation? The essential guide to DX (Pricewaterhouse Coopers, n.d.; World economic forum, 2020)	Digital transformation is the cultural, organizational and operational change of an organization, industry or ecosystem through the intelligent integration of digital technologies, processes and competencies across all levels and functions in a gradual and strategic manner.
What is Digital Transformation? (Manyika, 2022)	Digital transformation is the strategic implementation of digital technologies.
What Is Digital Transformation? (Grace, 2018)	Digital transformation is the process of using digital technologies to transform existing traditional and non-digital business processes and services, or create new ones, to meet changing market and customer expectations, thereby completely changing the way businesses are managed and run, and the way they deliver value to customers.
What are the Benefits of Digital Transformation? (Kyrylenko, 2020)	Digital transformation is the integration of digital technologies into all areas of business. It leads to fundamental changes in the way businesses operate. Organizations across industries benefit from digital transformation: it allows businesses to modernize legacy processes, accelerate efficient workflows, enhance security and increase profitability.
What Is Digital Transformation? (Novikova, n.d.)	Digital transformation is a key component of an overall business transformation strategy, and while it is not the only factor, it is critical to the success or failure of any transformation effort. The right technology – combined with people, processes and operations – enables organizations to adapt quickly to disruptions and/or opportunities; meet new and evolving customer needs; and drive future growth and innovation, often in unexpected ways.

Digital transformation has both positive and negative consequences. Digital technologies require the transition of countries to post-industrial development, where knowledge and information are the main tools.

PwC (PricewaterhouseCoopers), an international network of companies offering professional services in the field of consulting and auditing, has identified three waves that characterize the possible course of automation in the period up to the 2030s (see Table 2).

The ILO report notes that employed young people (under 24) face the risk of losing their jobs due to automation. At the same time, this risk is greater than that of the older generation. Around the world, young people express fears that new technologies, namely artificial intelligence and robotics, will leave them unemployed. One of the many examples is the automation of cashier jobs in a supermarket.

In its report, McKinsey noted that 400 to 800 workers worldwide could lose their jobs by 2030.

Such professions including sellers, security guards, and receptionists, are at risk (Manyika,2022).

According to research, by 2024, artificial intelligence will have a higher level of ability than foreign language translators (see Figure 1); by 2026, artificial intelligence will be able to independently create written works for schoolchildren; and by 2027, artificial intelligence will be able to independently drive a truck (Grace, 2018).

In recent years, the acceleration of the introduction of new technologies among the surveyed companies has become evident. There is already a redistribution of current tasks between humans and machines. Figure 2 shows the share of current work tasks performed by humans and machines in 2020 and forecasts until 2025.

In the future, machines focused on data processing and retrieval will become increasingly common (see Figure 2). To maintain their comparative advantage, humans must learn to lead, advise, make decisions, reason, communicate and interact.

TABLE 2 Waves of the automation process

Wave	Description and consequences
Wave 1. A wave of algorithms (until the early 2020s)	Automation of basic calculations and analysis of structured data. Affects industries that depend on working with data.
Wave 2. Penetration wave (until the end of the 2020s)	Dynamic interaction with technology in the organization of administrative records and decision-making. This also includes the use of robotics to perform tasks in semi-controlled environments, for example, to move objects in warehouses.
Wave 3. A wave of autonomy (By the mid-2030s)	Automation of physical labor and manual manipulations, as well as problem solving processes in dynamic real-life situations that require an appropriate response, in particular in transport and construction.

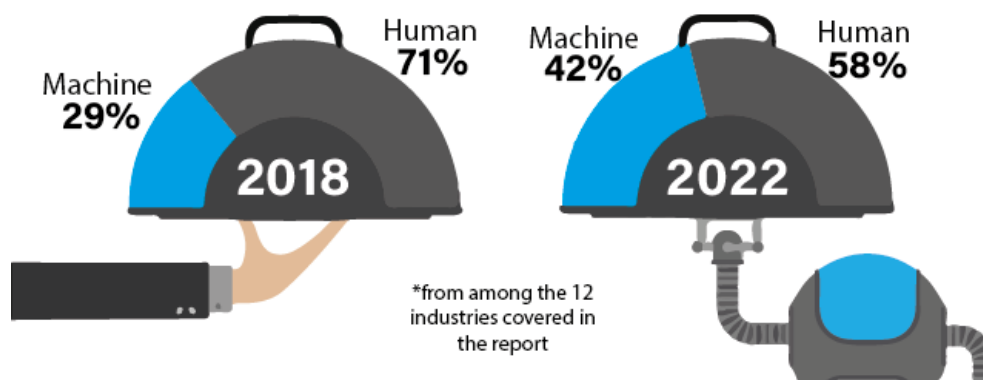


FIGURE 1 Time required to perform a task by a human compared to a machine
 Source: author's development based on sources (The Future of Jobs Report 2018, 2018; Novikova, n.d., Chaliuk, 2021)

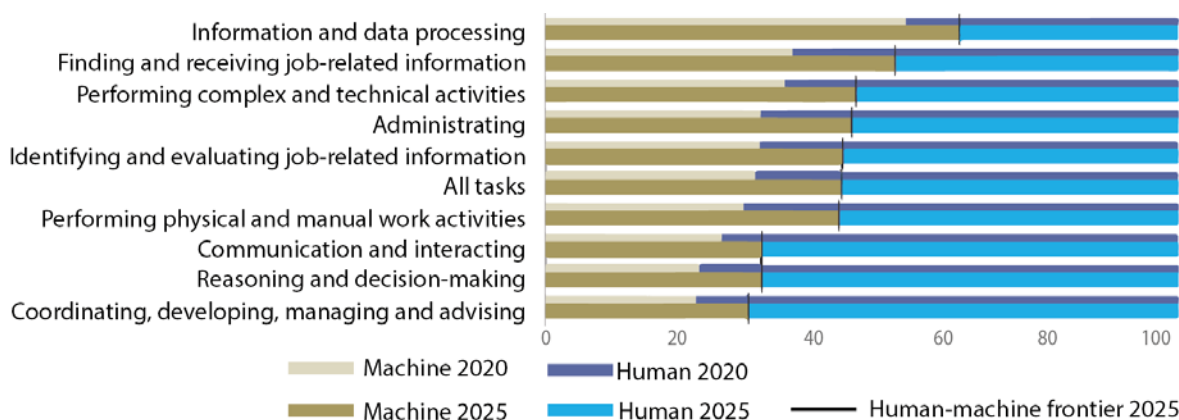


FIGURE 2. Share of tasks performed by humans and machines, 2020 and 2025
 Source: author's development based on sources (World economic forum, 2020; Chaliuk, 2020; Chaliuk, 2021)

The Forbes article talked about the risk of being affected by automation due to job cuts among administrative workers. Quote from Forbes: "You know who answers the phone at three in the morning? A robot. And you know who doesn't answer the phone at three in the morning? A human." (Stewman, 2018)

4 Conclusions

The formation of the digital economy is a leading trend in the modern world and a key factor in economic growth. Information technology and robotics have contributed to a radical change in the labor market. Business and government must work together to help people master and take advantage of new technologies. The positive effects of automation include: reduction of labor costs for companies and the emergence of new jobs and new professions that will be associated with information and communication systems. The negative consequences include the inability to use the benefits of automation, the loss of the country's competitive position in the market of goods and services, and the increase in income asymmetry between the rich and poor.

The main directions of state regulation of labor market problems should be:

- 1) ensuring working conditions and material equipment of workplaces of employees working with information and communication systems and automated systems (robots, machines, artificial intelligence, etc.);
- 2) development of a new system of remuneration of employees with non-traditional forms of employment;
- 3) creation of legislation on social protection of workers with formal and informal forms of employment (social benefits, health and life insurance, insurance in case of temporary disability, in case of job loss during retraining);
- 4) regulation of the mechanism of new contractual relations regarding traditional and non-traditional forms of employment, working hours, workplace organization, and so on;
- 5) formation by the Ministry of Education and Science of training programs for innovative specialties and professions related to the use of automated equipment, artificial intelligence and other digital technologies.

The impact of digital technologies on various sectors of the economy will have a positive impact

only if the state is actively involved in preventing the growth of problems in the labor market caused by digitalization. Thus, information systems will contribute to the transformation of educational and cultural institutions into serious information centers. Undoubtedly, humanity and the state will be in constant adaptation to the dynamics of the development of information technology and automated systems – in the permanent training and retraining of specialists with digital skills, as technology is developing much faster than the ability of people to respond to new threats of the digital age.

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