The Main Vectors of Labor and Education Transformation of Modern Workforce

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Abstract The article reveals that in the long run social and labor relations may undergo radical changes in three main directions or vectors.

First, the boundaries of the traditional division of labor will change, the boundaries of professions will be erased, the rate of "extinction" of traditional professions will accelerate, and new, previously unpredictable ones will emerge.

Second, forms of employment are changing. Along with the traditional contractual forms of labor relations, employment in the form of freelance, crowdsourcing, insourcing, flexible forms of inclusion of professionals in labor activity, remote employment, project form of employment, etc. are actively developing.

Third, human mobility increases throughout employment. This is due to the intensification of migration processes (more than 60% of those who change their place of residence do so for reasons of work and employment), as well as inter-professional, intersectoral, intra-firm mobility.

"Lifelong learning" as a principle and concept is increasingly developed and implemented in practice. The trend is becoming more stable when a person changes his professional affiliation 3…4 times during his working life. In the workplace, traditional barriers to the professional division of labor are increasingly being overcome. Jobs are formed for the tasks, competencies of the employee, the client, technology and more. Therefore, a person needs to be guided in professions not only during their choice, but also throughout their working life.

Keywords Labor · Education · Transformation · Workforce · Creative business · Digital technologies

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1 Topicality

During the presentation of the Economic Audit of the country and Vectors of economic development until 2030, the Ministry of Economic Development, Trade and Agriculture of Ukraine identified economic vectors that will be able to ensure the recovery and future growth of the domestic economy, including [2]:

- Reduction of the state's share in the economy (continuation of privatization).
- Development of the financial sector.
- Reducing the regulatory burden on business.
- Infrastructure development in the agricultural sector.
- Favorable tax and legal regime for innovative and research companies.
- Digital economy.
- Ukraine's reputation in the world and strengthening trade diplomacy.
- Creating an economic basis for the development of education, medicine, culture and social services.

In turn, the above and other processes change the labor market, defining its main features and vectors of development. In order to predict the probable image of the labor market and the workplace in the conditions of economic transformations, first of all, it is necessary to clearly outline the main processes and megatrends that determine the future of the market and cooperation in the construction sector with innovative development. It is also necessary to determine how the content of the "work" of the workforce will change and what will be the "labor activity". Insufficient scientific substantiation of the regulation of innovative development of construction and setting trends allows to determine the idea of the need and directions for these processes and justifies the choice of research topic.

2 Presenting Main Material

Summarizing the existing numerous studies on the representation of future employment, researchers identify a number of megatrends that will determine the development of the labor market in the near future. Automation and robotization of production processes, the introduction of digital technologies and artificial intelligence is a far from complete list of global trends that will significantly affect the workplace of the future labor market. A global trend is an objective trajectory that affects and changes society as a whole. Along with it, the market, the environment and working conditions are changing. The main current global trends affecting the transformation of labor and workforce skills are [4–10]:

1. ***Creativity of business.*** Modern progressive economy in terms of economic theory is characterized as "knowledge economy" or "information economy", the main features of which are the intellectualization of labor, generation of new ideas, business creativity, digitalization of technology and more.

The new economy is formed on the basis of the use of imagination, creative resources and knowledge, which are transformed in the form of new ideas and values. Accordingly, the success of economic development is determined by the efficiency of the synthesis of creativity, entrepreneurship and technological innovation. Creative industries, operating at the intersection of art, culture, business and new technologies, today form the basis of a developed world economy.

In Ukrainian society, creative industries and creative entrepreneurship are relatively new concepts, but they are well known in Europe, the United States and other developed countries due to the possibility of practical adaptation. Innovation and creativity are one of the priorities of the European Union's socio-economic development program "Europe 2020", the main purpose of which is to promote creativity through lifelong learning as a driver of innovative development and a key factor in human development.

Intensive development of the modern knowledge-intensive economy determines the formation and implementation of the concept of creativity, which provides innovative progress of socio-economic development. It should be noted that the creative economy significantly expands the possibilities of traditional production of goods and services. Creative industries are effectively developing and interacting with sectors of the traditional economy. They now account for 7% of world GDP, growing by 10% annually. The sphere of creative entrepreneurship is developing more rapidly, even than the production and services market, providing jobs for about 8.3 million EU citizens, which gives it the status of an effective economic model [1].

The impact of creativity on the economy is determined by such indicators as job creation, the ability to attract investment and use it effectively, the creation of value chains in which representatives of "traditional" and creative industries are combined and interact. By definition, creative industries are understood as a set of economic activities that are the basis for the formation of added value and the creation of new jobs through cultural (artistic) and creative expression. Goods and services that are the result of such activities are the result of creativity, skills and talent of the individual.

Therefore, to assess the effectiveness of creative industries, the whole chain should be explored: from the generation of a creative idea through the formation of an innovative product to the generation of added value. In the context of growing globalization and the growing needs of companies to ensure sustainable success in the market, there is a need to increase the efficiency of operations. This task should be addressed on a par with others, such as the ability to think innovatively, providing a dynamic strategy for the interaction of resources and competencies in accordance with the requirements of the environment. The emergence of innovative enterprises generates the ability and motivation to find new solutions, concepts and ideas aimed at developing and improving the efficiency of technologies and activities. By increasing its own competitiveness, the company affects the state of the economy not only nationally but also European. The key resources of companies are creative workers with unique competencies, a lively mind, a desire for excellence in business and ensuring effective growth through innovation. In order to initiate innovation, many employers have adopted a strategy of competency management by encouraging and motivating

employees through self-realization and promoting the realization of their creative potential and creative abilities.

Because creativity-based production is creative, the extraordinary development of digital technologies and the globalization of information exchange networks have made the creative sector one of the most dynamic in the world. Creative industries create new jobs, diversify the economy and create a comfortable urban environment. In developed countries, the creative sector of the economy generates up to 10% of national GDP [1].

Promising research of the present is the identification of factors influencing the formation of creative industries in Ukraine, the actualization and justification of the implementation of the concept of creativity of the economy of Ukraine. Thus, the identified indicators of creativity should include increasing the competitiveness of existing businesses, increasing local budget revenues, improving the quality of life, reducing the outflow of talent, increasing the investment attractiveness of the territory, increasing tourist activity, improving the quality of cultural life. Some studies have proved the impact on the GDP of Ukraine of innovative development of creative sector enterprises in the chain "generation of creative ideas → formation of innovative products → generation of value added." Numerical measurement of the effectiveness of creativity through correlation-regression analysis proves the existence of a close relationship between GDP, the number of enterprises producing innovative products, the volume of sales of innovative products and the volume of innovative products exported. Such a multifactor model can be used to assess and forecast the impact on GDP of the development of innovation in Ukraine, where a significant share are enterprises belonging to the creative sector.

Thus, the unique properties of human capital, talent, knowledge can be a stimulus for the development of the domestic economy, realized in the form of creative industries and act as a tool for generating value added nationwide, providing consumers with innovative products. Therefore, it is important for Ukraine to adopt a strategic program document, within which the state will carry out targeted work for the formation and development of creative potential. At the state level, it is necessary to address the issue of supporting creative industries, which consist in the simultaneous development of such areas as, for example, the introduction of special education and lifelong learning.

The transformation of the education system requires a radical reform aimed at bringing the quality of training in line with the requirements of the creative economy. A modern professional must not only have certain knowledge, skills and competencies, but also be able to generate them throughout his life. It is also necessary to introduce programs to support creative entrepreneurship, work on grants, introduce educational programs in this area, promote the opening of new enterprises in the creative economy sector, provide them with soft loans. We also need a progressive legal framework, namely a law on support for startups, simplified tax conditions, tax rebates for those who invest in innovative industries, and affordable business conditions. Successful creativity in the form of creating a favorable intellectual environment and developing a system of socio-economic interaction will allow employees to realize their own creative abilities by generating new ideas and implementing them

in the form of innovative products that will ensure sustainable development of the domestic economy.

2. ***Digitalization of technologies.*** Given the modern signs of development of society, it can be argued that the modern information society of the world has reached the next stage of developmenthas become digital. This term directly indicates the way all public institutions operate: the activity is realized through digital visualization of objects. Therefore, today the most commonly used terms are: in Europe-digital economy (Digital Economy), in the US-API-technology (Application Programming Interface technology). That is, the digital economy is an economy based on digital computer technology. The digital economy is also sometimes referred to as the Internet economy, the new economy, or the web economy.

According to research by McKinsey Global Institute, cross-border data flows have increased 45-fold over the past decade, and continue to grow. Given today's challenges and responding to rapid change, the EU has embarked on a new common market-digital, which should strengthen existing economic freedoms and foundations throughout the community and develop digital technologies—take full advantage of risks, minimize risks, respond quickly to challenges, including security. The role of digital technologies in EU trade policy is also significantly increasing, which Ukraine must take into account [3].

The digital economy is based on the widespread and widespread use of automatic systems, devices and equipment using computing and control units and devices capable of functioning without human intervention. When equipped with executive bodies—mechanisms, they turn into works that can directly replace human labor or a number of its functions and actions. The modern digital economy is artificial intelligence, robotics, electronic money, industrial biology, large data processing, unmanned vehicles, and so on. For the general public, the "digital economy" means a new level of digital service, when most purchases and services go online.

The peculiarity of Ukrainian digital development is that the users of online technologies are small and medium-sized businesses that somehow work on the Internet and mostly use digital methods to promote their services.

The digital economy is the economy of virtual worlds. Its main space is the Internet. But it should be understood that not only the Internet determines the direction of the digital economy—it is about technology in general: smart apartments, smart cities, jobs that completely replace people, online stores (Amazon, Aliexpress), Internet banking (Privat 24), messengers (Facebook, Telegram), etc. This is exactly what distinguishes the digital economy from the traditional one—it is consumer-oriented. Therefore, you can often hear instead of "digital economy"-"economy on demand" (on-demand economy).

The global digital space is developing dynamically under the influence of active investment activities of the world's leading countries and the influential policies of the world's largest IT companies. There are structural shifts in the capital market, which, first, form a growing trend of investment in global projects through the formation of consortia and integration groups with the participation of leading countries and intensively developing countries. Secondly, global investment flows are directed both

in the technology of "mass demand" (Internet games, e-commerce) and in the technology of storing arrays of databases, which leads to the monopolization of global companies on intellectual capital and digital information space. Third, the development of global and local digital markets creates favorable conditions for countries with a high level of education and the level of informatization of national economies [3].

Thus, the digital economy is not only the digitalization of production, distribution, exchange and consumption of goods, but a system of more general processes, in relation to which the economy is one of the applications. The digital economy as a global concept of modern economy puts forward new standards of quality of life, work and communication between people. The ability to adapt quickly to change and optimize in the shortest possible time, adapting to global trends—the main challenges posed by today's digital economy.

No less important are the socio-economic consequences of digitalization, because the displacement of man from the production process is a global social problem. The modern global labor market is a complex multi-component and dynamic system that is permanently affected by information technology, which entails changes in the content of the labor process, its organization, employment structure, social and labor relations. Objective automation processes, even if restrained by governments and society, will accelerate and possibly reach the point where only a few million highly qualified professionals will be enough to support the entire global production and logistics system. In this sense, the reduction of available jobs in the world economy, the emergence of a whole class of "extra" people, total retraining of staff, the destruction of the usual mechanisms of "guarantees of the future" (decent pension, guaranteed social protection, etc.)-quite possible realities.

In addition, the impact on labor resources of technology development and automation is unpredictable. This process is so complex that no country reportedly has a formal strategy for adapting to future change, and governments face ever-changing priorities in trying to develop effective strategies for the digital economy. An analysis of adaptation strategies shows that today we can observe certain types of actions that are to some extent applied or discussed by governments to mitigate future shock. Such actions include, in particular, stimulating the creation of new types of jobs. In today's economy, it is very difficult to create conditions that are guaranteed to create jobs in the long run. Companies can maintain jobs as long as there are subsidies, but abandon them in favor of more efficient solutions when subsidies end. A possible solution would be to support areas of the economy where human action is virtually impossible to replace with a robot or neural system. This leads to a change in the interpretation of the very concept of the workplace, when instead of work a person will be engaged in the realization of their creative potential, which will correspond to the trends of the network society.

At present, digitization technologies are penetrating all areas of human activity. Unlike analog data, digital data is discrete, it can be stored, copied, analyzed and transmitted virtually without restrictions. Another important aspect of digitalization is the gradual "replacement" of familiar reality with digital, augmented or virtual reality. Virtual reality technologies amplify the digital world, and augmented reality

technologies blur the boundaries between worlds. Augmented reality is used in the workplace in complex industries, forming new ways of working, communicating and collaborating across the enterprise.

The digital labor market also contributes to the formation of innovative employment. As a result of structural changes in the economy, the share of industrial production is declining, which shaped the demand for standard employment. The service sector, which operates under flexible working hours, is growing with a longer or shorter working day than the current legislation. There is a growing need for greater mobility of labor resources, which leads to a stronger role of fixed-term employment contracts.

Thus, digitalization, like any change, has its pros and cons. The main risk of digital transformation of the economy is a possible rise in unemployment. According to the analytical materials of the World Economic Forum in Davos, each industrial revolution did lead to unemployment at the initial stage, but after a short period of time (1 to 5 years) there were new needs and demands from the market, which led to new professions. In fact, each industrial revolution created new types of economic activity, new approaches, models, and this in turn changed the labor market [4].

McKinsey & Co. estimates that by 2030, 400 to 800 million people (15 to 30% of the world's workforce) will be out of work through the development of artificial intelligence and automation. Many operations performed by employees today have the potential for automation. According to McKinsey, about 60% of all occupations have at least 30% of activities that can be automated using modern technology.

There are other estimates, for example, according to the European Commission, about 50% of current jobs in the world can theoretically be automated. This means that human labor in some processes will not be needed [4].

Another example—according to the analysis of Visual Capitalist, in the US by 2030 will be digitized [4]:

- 50% of jobs in trade;
- 57% of jobs in the field of transport;
- 60% of jobs in agriculture;
- 60% in production;
- more than 70% in the field of accommodation and food.

According to the Ukrainian Institute of the Future, the situation on the labor market in Ukraine in the perspective of 10 years may be less dramatic than in developed countries. In the next 3–5 years, digitalization and automation, on the contrary, will solve the problem of labor shortages [4].

This is due to the fact that digitalization not only leads to the disappearance of professions and reduced use of human labor, but also creates new industries (sectors, professions), provides unlimited opportunities for the realization of human skills and talents. For example, according to a study by McKinsey's Paris office, the Internet has eliminated 500,000 jobs in France over the past 15 years, but at the same time created 1.2 million more. That is, instead of one liquidated job, 2.4 new ones were created [4].

Thus, total digitalization and the development of the digital economy in Ukraine will somehow be accompanied at the first stage by negative processes of job loss, but digitalization will create new directions, which in a few years will lead to new demand, which, as the experience of industrial revolutions shows. much greater than the demand of the past period.

Thus, professions that require social and emotional skills, special cognitive abilities, such as logical thinking and creativity will be in demand. In order to be in demand in an extremely changing world, a person must constantly learn. It is here that the principle of "knowing how to learn throughout life and become self-fulfilling and competitive" is critical.

Ukraine needs to move forward with a modern national curriculum for general and professional digital competences and skills as key components of the digital economy. The priority of the state should be to create and coordinate relevant initiatives and provide resources. The state strategy to prevent the risks of job losses has several levels of implementation:

- educational, the creation of academic programs and educational infrastructure for the training of specialists in new specialties;
- retraining programs for citizens and adaptation programs for citizens;
- structural initiatives: updating the state classifier of professions, is development and approval of the list of digital professions (based on labor market requirements, digital trends), their introduction in specialized educational institutions.

Thus, it can be argued that the world has entered a new era in which the impact of digital technologies is increasingly being felt in all sectors of the economy [4]:

1. Digitalization is radically changing traditional industries and sectors. There is a change of classic business models, analog processes and operations flow into the Internet, it is possible to form personal proposals for each individual client. Automation and robotics minimize the need for human resources, rapidly increasing efficiency and productivity. Radical changes are taking place in those industries that are considered basic for Ukrainian industry, metallurgy, oil and gas production, energy, construction, etc.

2. Digitalization creates new sectors and segments, as well as new professions. According to the Ukrainian Institute of the Future, up to 60% of value added in Ukraine in 2030 will be created in new high-tech sectors of the economy, such as artificial intelligence, robotics, bioengineering, 3D printing, nanomedicine and others. In the future, 65% of today's children will engage in activities that do not yet exist today.

Therefore, the digital economy is not a separate sector of GDP, such as the ICT industry or industry, it is a platform that, like the human circulatory system, permeates all sectors of the economy, radically changes them, changes the structure of the Ukrainian economy, creates new segments and even industries, uniting them into a single whole. The impact of digitalization is determined by the added value it creates for each sector of the economy or sphere of life at the macroeconomic level, or for a specific product or service at the micro level. And the main effect of digitalization is to change the value chains.

However, technology and digitalization will displace people from their usual processes-production, services, entertainment, trade, education and even medicine. First, the work will be in the nature of numerous but short-term projects. Previously, it was believed that having a permanent job is a guarantee of success and security. However, against the background of recent changes in the world economy, permanent employment does not guarantee permanent employment. By 2040, the labor market will mainly consist of people working simultaneously in several places in small firms, working part-time. Daily monotonous work, consisting of the same responsibilities, will be replaced by a business that will provide many short-term projects, the diversity of which a person will control independently throughout life. Thus, people will carry out small projects lasting from a few days to several years, which will create the conditions for an increase in the number of entrepreneurs who work exclusively for themselves.

This will be the locomotive of the bulk of jobs by 2040. Secondly, a large number of different employment agencies will be involved to find highly qualified and creative professionals. If now recruitment agencies are looking for specialists of the general public, in the future it will be a search exclusively for creative people with special abilities, and in the future such recruitment companies and organizations will play a more prominent role in public life. Third, the responsibility for one's own success will increase over time. Professionals will have to constantly develop future projects, as well as permanently develop special skills and obtain the education necessary for the successful implementation of these tasks.

3 Conclusions

Thus, in the long run, social and labor relations may undergo radical changes in three main directions or vectors.

First, the boundaries of the traditional division of labor will change, the boundaries of professions will be erased, the rate of "extinction" of traditional professions will accelerate, and new, previously unpredictable ones will emerge. Experts note that in the coming years, up to 10% of existing professions may disappear. From this point of view, the principles of division and cooperation of labor are changing. Rigid consolidation of functions in a particular profession, including in professional standards, contradicts the dynamics and flexibility of the social and labor sphere. Robotization and automation radically change the content of work in all industries and types of employment, which, accordingly, changes the requirements for employee competencies. Thus, narrow professional training contradicts the need for the formation of cross-cutting, supra-professional competencies (sociability, non-standard and critical thinking, the ability to work with modern digital technologies, etc.), the importance of which is growing every year [5]. Both at the beginning of the career and throughout the work a person needs to navigate in the world of professions, in the dynamics and prospects of their changes in order to timely form and develop their competencies,

increase their competitiveness in the labor market taking into account the prospects of its transformation all life.

Second, forms of employment are changing. Along with the traditional contractual forms of labor relations, employment in the form of freelance, crowdsourcing, insourcing, flexible forms of inclusion of professionals in labor activity, remote employment, project form of employment, etc. are actively developing. At the same time, new forms are becoming more and more acceptable for young people and highly competitive staff. Therefore, during professional self-determination and career guidance it is necessary to take into account not only transformations in the content and division of labor, but also opportunities, prospects for the use of flexible (new) forms of social and labor relations.

Third, human mobility increases throughout employment. This is due to the intensification of migration processes (more than 60% of those who change their place of residence do so for reasons of work and employment), as well as inter-professional, intersectoral, intra-firm mobility.

"Lifelong learning" as a principle and concept is increasingly developed and implemented in practice. The tendency becomes more stable when a person changes his professional affiliation 3…4 times during his working life. In the workplace, traditional barriers to the professional division of labor are increasingly being overcome. Jobs are formed for the tasks, competencies of the employee, the client, technology and more. Therefore, a person needs to be guided in professions not only during their choice, but also throughout working life. As a result, objectively there is a need for such a mechanism that would allow the workforce in the face of exponential changes in advance to communicate between technological transformations, transformations in the division of labor, in the "world" of professions, education, labor market, development. Therefore, the main effect of regulation will be to increase the level of innovative development for many industries, including construction-increasing the profitability of its members, competitiveness, as well as increasing tax revenues to budgets at all levels.

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