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## **ANALYSIS OF THE WORLD DEVELOPMENT OF HUMAN RESOURCES IN THE DIGITAL ECONOMY**

*This article discusses the new trends of development of human resources in the digital economy. During the period of socio-economic modernization of countries, the labor market is the most sensitive to these changes. In order to increase their competitiveness, it is important for employees to be able to focus on the prospects of transformation and change of professional requirements in the labor market and to form and develop their competencies in a timely manner. In this regard, the importance of such labor qualities as communicability, non-standard and critical thinking, ability to work using modern digital technologies, etc. is very high. The study identified the need to form a unified concept of orientation of workers, enterprises, society in professional division of labor taking into account the interests of all subjects of social and labor relations, prospects of transformation of the labor market and requirements to professions. Within the framework of this concept, professional orientation and professional self-determination are considered as a mechanism for ensuring the unity and continuity of the process of reproduction of human resources in terms of each person's choice of an individual path of professional development.*

**Key words:** *human resource, digital economy, professional orientation, mechanism, professional development.*

*Рассмотрены новые направления развития и качества человеческих ресурсов в условиях цифровой экономики. В эпоху социально-экономической модернизации государств наиболее чувствительным к текущим преобразованиям является рынок труда. Для работников, с целью повышения своей конкурентоспособности, имеет большое значение умение адаптироваться на перспективы трансформации профессиональных требований на рынке труда и проявлять гибкость в формировании и развитии своих компетенций. В этой связи увеличивается значимость таких трудовых качеств, как коммуникабельность, неординарность и умение использовать современные цифровые технологии и др. В ходе исследования определена необходимость формирования единой концепции ориентации работников, компаний и общества в профессиональном разделении труда с учетом интересов участников трудовых отношений, перспектив трансформации рынка труда и требований к профессиям. В ходе осуществления данной концепции профориентация представляет механизм, который обеспечивает общность и постоянность процесса воспроизводства человеческих ресурсов в рамках выбора каждым индивидуумом своей области профессионального развития.*

**Ключевые слова:** *человеческий ресурс, цифровая экономика, профориентация, механизм, профессиональное развитие.*

*Берілген мақалада цифрлық экономика жағдайында адам ресурстарының жаңа сапасы мен оны жетілдіру бағыттары қарастырылған. Мемлекеттердің қоғамдық-экономикалық модернизация уақытында ең сезімтал саласы болып еңбек нарығы есептелінеді. Жұмысшылар үшін қойылатын еңбек нарығындағы кәсіби өзгерістер мен талаптарға сәйкес, адами ресурстарының уақытысында өз қабілетерін ұжастастырып, жетілдіруі маңызды саналады. Осыған орай, келесідей еңбек сапасына көңіл бөлген абзал: коммуникативтілік, ерекше және критикалық ойлау, цифрлік технологиялармен жұмыс жасай білу және т.б. Зерттеу барысында қоғамдық-еңбек қатынастардың субъектілерінің қызығушылығына орай жұмыстың кәсіби бөлінуіне жұмысшылардың, кәсіпорындар мен қоғамның бірыңғай бағдар концепциясын құру қажеттілігі анықталады. Бұл кәсіби бағдар және кәсіби өзін-өзі тану концепциясы әр тұлғаның өзінің*

*кәсіби жетілу траекториясы аспектісінде жұмыс ресурстарын қайта құру процессінің және бірыңғайлығының тетігі ретінде қарастырылады.*

*Түйін сөздер: адами ресурстар, цифрлық экономика, кәсіби бағдар, тетік, кәсіби даму.*

During the periods of modern socio-economic changes in Kazakhstan, the labor market is recognized as the most sensitive one. Also, according to the estimation of researchers, the technological changes will have the greatest impact on the world labor market along with geopolitical and demographic trends in the period up to 2025. The positive result of further digital transformation of economic sectors, consistent introduction of automation and robotics systems will be the increased productivity in enterprises. At the same time, there is expected a threat of disappearance in a large number of jobs and a few number of workers involved in these jobs, as their functions can be replaced by robots with software, neural networks, artificial intelligence and etc.

As it was studied by Global McKinsey Institute, there could be automated from 2 to 50% of work expressed in man hours by 2036 and this amount in turn will increase to the share from 46 to 99 % by the end of 2066 [1]. From the data of World Bank Report, it is known that, the demand for certain skills in the labor market is rapidly changing, which creates both new opportunities and new risks in the market[2]. For this reason many analysts predict structural unemployment in the coming decade for most countries, both developing and developed, which will become massive, especially among medium and low-skilled workers. As for the information taken from International Labor Organization, the number of unemployed labor worldwide will reach 212 million people in 2019, which will be 11 million increase in the previous 3 years. D. Autor, an American economist, notes in his study, that this process will primarily affect competences of those, whose functionality contains a sufficient number of template functions of predictable repetitive physical operations that can be automated. Due to the fact that these specialists are usually highly-paid, automation in production will be economically feasible [3].

Moreover, according to analysts, digital technologies will have a marked positive impact on the labor market. According to the World Economic Forum (WEF) report, automation of many industries will generate more than 2 million new jobs worldwide. Simultaneously, due to the introduction of automation and digitalization of industrial production, the number of safe jobs will increase [4].

The development of digitalization will have an impact on the reduction of unemployment, shadow employment and job search time. This is because digital platforms create new employment opportunities, especially:

- Speed up the job search and recruitment process by gaining access to an extensive database of relevant vacancies. For example, more than 130 million people are registered on the LinkedIn platform in the United States, which represents a substantial proportion of the working population in the country;
- Help to develop additional skills and abilities, particularly for people who have not previously had such opportunities due to social or geographical constraints [5];
- It is possible to work remotely, which makes it possible to increase the productivity of specialists from regions, where the demand is limited for them;

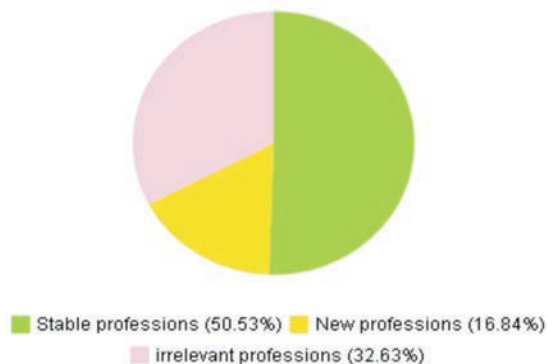
– Increase productivity of labor force, as it ensures the applicant’s profile of the proposed vacancy to be more accurate.

Nowadays, on average, the share of stable professions in all sectors amounts to 48%, irrelevant jobs make up 31%, and new ones are about 16% (figure 1).

It is forecasted that, by 2022 this share results will change as follows: the share of new professions will increase to 27%, the share of irrelevant professions will decrease to 21%. Thus, it is expected that by 2022 the structural reduction of certain types of jobs (decrease by 10%) will be fully balanced by the creation of jobs and the development of new professions (growth by 11%).

In a digitalized economy, both workers and employers must be able to adapt to new conditions, as social and labor relations are also undergoing radical changes. First of all, the principles of the traditional division of labor are changing, the boundaries of professions are being erased, the rate of disappearance of traditional professions and the emergence of new, previously unpredictable ones are accelerating.

The strict consolidation of functions for a particular profession, including in professional standards, comes at odds with the dynamics and flexibility of the social and labor sphere. Robotics and automation fundamentally change the content of work in all industries and types of employment, which changes the requirements for the competence of workers. Narrow professional training comes at odds with the need to form cross-cutting, pre-professional competences. It is important for employees both at the beginning of professional career and during the whole working to be able to easily adapt to various transformations, dynamics and prospects of changes in professional requirements and develop their competences in a timely manner in order to increase their competitiveness in the labor market. In addition, year by year the importance of such qualities as communicability, non-standard and critical thinking, ability to work using modern digital technologies, etc. is increasing.



**Figure 1** – Share of stable, new and irrelevant professions in all industries

One of the results of digitalization is the change in forms of employment. Along with traditional contractual forms of employment relations, new types and flexible forms of employment - freelance, in sourcing, remote employment and others - are actively developing. At the same time, the usual forms of labor organization, such as the territorial and organizational link of the employee to the employer are disappearing. According to

the World Labor Organization, today’s number of remote workers in the world is 17%, and in Japan and the United States is about 40%. The advantages, in particular, of a freelance worker are reduced costs for premises and office equipment, as these costs are transferred to workers; flexibility of the number of employees involved in the project, reduction of costs of dismissal; raising the tax base by replacing civil-law relations with labor relations, etc. At the same instant, new forms are becoming increasingly preferred by young people and highly competitive personnel. Therefore, professional self-determination and career guidance need to take into account not only transformations in the content and division of labor, but also opportunities and prospects of using new flexible forms of social and labor relations [2].

One of the today’s trends is the growing instability of skills. Given the wave of new technology and trends are destroying business models and the changing division of labor between workers and machines transforming current job profiles. The vast majority of employers surveyed expect the skills needed to work in most existing jobs to change significantly by 2022. It is expected that the stability of skills on average worldwide will be about 58%, i.e. 42% of professional skills in the period 2018-2022 will be transformed. The main trends in demand for skills identified by the study [27] include, on the one hand, the continued decline in demand for manual skills and physical abilities, and, on the other hand, a decrease in demand for skills related to the management of financial and other resources, as well as the installation of basic technologies and repair works (table 1).

**Table 1** – Comparison of Demand for Skills in 2019 and 2022

Current year, 2019	Potential year, 2022	Will disappear by 2022
Analytical thinking and innovation.	Analytical thinking and innovation.	Manual agility, endurance and accuracy
Comprehensive problem solving.	Active learning and learning strategies.	Memory, verbal, auditory and spatial abilities.
Critical thinking and analysis.	Creativity, originality and initiative	Management of financial, material resources.
Active learning and learning strategies.	Design and programming technology.	Installation and maintenance technology.
Creativity, originality and initiative.	Critical thinking and analysis.	Reading, writing, mathematics and active hearing.
Attention to detail, reliability.	Comprehensive problem solving.	Human resources management.
Emotional intelligence.	Leadership and social influence.	Quality and safety control.
Reasoning, problem solving and imagination.	Emotional intelligence.	Coordination and time management.
Leadership and social influence.	Reasoning, problem solving and imagination.	Visual, auditory and speech abilities.
Coordination and time management.	System analysis and evaluation.	Technology use, monitoring and control.

Note – Compiled based on the source [4]

Thus, in the twenty-first century, workers of very many professions will be required to have digital literacy, the demand for which highlights the transformation of society from industrial to knowledge-based society. By 2022, the skills most in demand will be: analytical innovation thinking, active learning abilities, technology development and programming, focusing on the growing demand for different forms of technological competences. As a result, knowledge becomes a basic wealth and must be continuously reproduced through continuous learning. The increasing penetration of algorithms and computer solutions into the economy will lead to the reorientation of labor market needs to «human in man»: creative origin, cultural aspects, individual and collective values, as well as universal «competences of the XXI century,» which will not be able to compensate for digital technologies.

The focus on services shows a significant increase in demand compared to their current significance on emotional intelligence, leadership and social influence opportunities.

Because human communication cannot be automated, there is a growing return on communication skills and ability to work in multicultural environments. Therefore, personal psychological qualities such as ability to interact with other people, empathy skills, creativity, originality, initiative, critical thinking, ability to convince and negotiate, attention to detail, resilience, flexibility, ability to manage information in modern information environments, media, social networks, marketing and analytical environments will also retain or increase their value. Nowadays these professional skills are extremely scarce, and the deficit of them will only increase in near future. In these circumstances, the strategic role of human resources capacity in the formation of the digital component of systemically important sectors of the economy becomes obvious [3].

In the process of transition to innovative economy, the current structure of employment of the population is changing, accompanied by reduction of inefficient jobs, redistribution of workers by sectors of economy, expansion of the sphere of services, development of innovative directions of activity and emergence of new directions of employment.

The labor market is responsive to technological changes. More and more businesses are introducing innovation and new technologies. The level of innovation activity averaged 10.6% in Kazakhstan, enterprises of East Kazakhstan region are most innovative - 15.5%, Karaganda and Nur Sultan - 14.7%, Kyzylorda - 12.1%, Kostanay - 12.1% .

It is obvious that most professions of the future are directly related to IT-technologies, as evidenced by the every year growing need for engineers and technical personnel. The requirements of employers also change along with the development of infrastructure directions. Today in the labor market of Kazakhstan already appeared requests for such specialists as the developer of artificial intelligence, deep learning engineer, data mining engineer, designer of virtual reality [4]. An increasing number of vacancies require an employee to be able to navigate large amounts of information, operate in conditions of uncertainty, and address cross-functional challenges.

The Kazakh labor market in accordance with world trends requires workers entering the labor market not only to possess new skills and knowledge, but also certain personal qualitative characteristics not related to any subject area - soft skills, allowing to quickly learn new information, be ready for changes and mobility, complex problem solving. They are meeting the main requirements like participation in the work process, ability to be in demand and useful to business.

It is obvious, that the development of digitalization of the economy faces a problem of quality of staffing. The highly qualified specialists for the development of the digital economy are formed in an educational context, under the influence of scientific and technological trends.

In the new conditions, the task is to form a human capacity, which owns new competencies of the digital economy. This applies both to future graduates and to available personnel who should learn new competencies. The main competence to be developed is the ability for continuous training, readiness to learn new knowledge and new emerging technologies. This becomes a key factor of successful professional development in the new conditions. However, today's pace of development of digitalization economy is much faster than the pace of training and retraining of personnel demanded by the economic conditions of our country. At the same time, there is now an excessive supply of personnel, which is almost difficult to retrain.

It is essential to enterprises to have a range of organizational arrangements towards integrating modern technology into their day-to-day operations and business processes for a purpose of remaining competitive in the face of rapidly changing staff skills requirements. As for some findings of researchers, due to the increasing competition for qualified employees, who meet the requirements of modern production, which will become more scarce and expensive in the coming years, it is useful to support the development of the existing workforce to work in new (and technologically reorganized) highly skilled jobs. Clearly, a more inclusive and proactive approach will be needed both to solve the problem of the impending shortage of necessary skills and to make new abilities more accessible to a wide range of workers by enabling them to take advantage of new technologies and work more effectively with them. It means that, it is significant for business development to train employees to work with new technologies, which could be implemented by introducing incentives for employees, who have learned new technologies. In addition to that, the employers, responding to the challenges of the digital economy and changing skills, note the need for the following transformations: need of automating operation - 84%, recruitment of new permanent staff with skills appropriate to the new technologies - 83%; acquisition of the necessary skills by employees of the enterprise - 76%; hiring the new temporary staff with skills appropriate to the new technologies - 74%; restoring the existing employees - 73%; hiring freelancers with skills appropriate to new technologies - 59%; outsourcing of some business functions - 56%; strategic dismissal of employees, who are lack of skills to use new technologies - 53% [4].

The need to provide sufficient skills creates an opportunity for enterprises to function as training organizations and to receive retraining and skills development support from a wide range of stakeholders. This model includes new forms of skills certification similar to existing schemes offered by a number of companies in the information technology sector. By setting objective requirements for a wide range of new jobs, such schemes can help to increase targeting of corporate training programs, increase labor market flexibility, and create clear skills and performance indicators to help employers screen candidates and certified workers for skills bonuses.

Business managers note the importance of developing new skills in the process of human resources development, such as analytical innovative thinking; creativity, originality



and initiative; active training; design and programming technology; critical thinking and analysis; Emotional intelligence; integrated problem management; leadership and social influence; ability to solve the problem; stress resistance and flexibility.

The key providers of training should be both public educational institutions and the private education centers. Simultaneously, more attention should be paid to the training of specialists in the enterprise (Figure 2).

In addition to that, the attention should be paid to the modernization of professional orientation systems. The nowadays' schemes of operation are more focused on choosing a profession by abilities and preferences available to young people (less often to the unemployed population). Moreover, in this case the labor market predictions, changes in professions, requirements to employment conditions are not taken into account. The prediction frame does not exceed 5 years, while such a system should be based not on available capacity, but on potential. Forecasting with a horizon of at least 10 years should be carried out taking into account competences, including cross-cutting over professional ones. Also, it is important to develop the practice of using independent professional orientation methods by the employed population.

Thus, it is an objective to form a unified concept of employee, enterprises and society orientation for professional division of work taking into account the interests of all participants of social and labor relations, prospects of transformation of the labor market and requirements to professions. Within the framework of this concept, professional orientation and professional self-determination are considered as a mechanism for ensuring the unity and continuity of the process of reproduction of human resources in the aspect of each person's choice of an individual path of professional development . This is due to the interconnected transformations of the technological, professional and functional division of labor, which are formed in accordance with the principles of Industry 4.0 and the innovative nature of social and labor relations.



Figure 2 – Predictive use of training providers

The changes are not only in the content labor functions, which transform the requirements to competences, but also in the organization of labor itself. The transition to the digital economy implies improved efficiency of management system. In the context of the widespread digitalization of business models and entire industries, the government, business and educational institutions should take coordinated early actions to be prepared for future changes by retraining and employing the released personnel. The most effective policy, consistent with the recommendations of the International Labor Organization and

benefiting from technological advances, is the creation of jobs in the formal sector of the economy.

The specifics of human resources development in Kazakhstan require the implementation of a policy of state regulation and state support for the formation of human capital adequate to the modern conditions of economic development. A high level of educational capacity is seen as enabling the individual to participate in decision-making in various fields like economic, social, political and cultural. In this regard, the development of the economic system should take place in accordance with the patterns of digital economy, where priority should be given to indicators of the performance of the intellectual potential of the country, competitiveness of domestic specialists, and conformity of their quality with international standards.

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