

Personnel Security in the conditions of digitalization of the Economy

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Abstract — The article discusses the main trends and prospects for the digital economy development and their impact on the quality of human resources. New threats and challenges to personnel economic security in the conditions of digital transformation associated with robot automation and technological progress are being revealed. The main indicators of the digital economy development in Russia and several other countries of the world are being analyzed. It is proved that human capital acts as a driver of economic growth and development of the digital economy. The target model of universal competencies, including digital, cognitive, social and behavioral skills necessary to accelerate digital transformation, increase competitiveness and personnel security of the national economy, is being substantiated.

Keywords — *digital economy, personnel security, threats and challenges to economic security, the target model of universal competencies*

I. INTRODUCTION

In the modern world, the digital economy is developing rapidly, which is a global development strategy for countries and regions. Digital transformation changes the social-economic paradigm of life. This is a new basis for the development of public administration systems, the economy, business, the social sphere, the whole society. The G20 Leaders Declaration (July 2017) emphasized that digital transformation is the driving force of global, innovative and sustainable growth, contributing to reduction of inequality and achievement of sustainable development by 2030.

Diffusion of innovations, rapid development of nanotechnology, time compression can lead the world to a new technological revolution, accelerated emergence of the seventh technological structure based on artificial intelligence,

and completely change not only the economy and environment, but also the nature of man himself.

In this regard, the problem of new requirements for the quality of human resources and personnel security at the level of the national economy deserves attention. Personnel security in work is understood to be a state of protection from negative effects on economic security by reducing the risks and threats associated with human resources, their intellectual potential and labour relations in general.

The purpose of this article is to study the effect of digitalization on the quality of human resources and the identification of personnel security risks. The main objectives of the study are:

- to consider the main trends and prospects for the development of the digital economy;
- to identify new threats and challenges to global economic security in the context of digital transformation;
- to analyze the main indicators of the development of the digital economy;
- to justify the target model of competencies necessary to accelerate the digital transformation of the national economy and ensure personnel security.

II. MATERIALS AND METHODS (MODEL)

Direction of the development in information technology and digital economy is closely connected with education and human resource development. This study is based on the UNDP methodology using the human development index. To

assess the quality of human resources in the labour market, the methodology of the Danish scientist J. Rasmussen is being applied. According to the chosen methodology, the total number of people employed in the economy is divided into three groups: "Knowledge" (high qualification, cognitive challenges), "Rule" (medium level of qualification, cognitive routine tasks), and "Skills" (basic level of education, mechanical tasks). A critical indicator for countries with developed digital economies is the share of employees in the "Knowledge" category, which is more than 25%.

III. RESULTS AND DISCUSSION

A. Many leading countries of the world are developing digital strategies of the state [1]. In July 2017, the Digital Economy of the Russian Federation program was adopted in Russia, the essence of which is the transition to a new technological level of social and economic development in order to ensure national sovereignty, increase the country's competitiveness, well-being and quality of life of people of Russia.

According to the World Bank, the share of the digital economy in total world GDP is 5.5%. Analysts predict a substantial increase, by 2035 its volume will exceed \$ 16 trillion [2]. Russia still ranks 39th in the world ranking of countries (see table 1). The contribution of the digital economy in the gross domestic product of the Russian Federation is 2.8%, and most of this (84%) is in the field of consumption (e-commerce, online search, offline purchases). However, from 2011 to 2015, the digital economy was growing 8.5 times faster than the Russian economy as a whole, and provided a quarter of the country's GDP growth [3].

TABLE. 1 Ranking of the world countries by the level of the digital economy development, 2016

Ranking position	Country	Average value of the index BCG-Intensity
1	Denmark	213
2	Luxembourg	212
3	Sweden	208
4	South Korea	205
5	Netherlands	198
6	Norway	191
7	United Kingdom	191
35	China	120
39	Russia	113
43	Brazil	97

Note: Based on materials of BCG Review. November 2017.; RBK. № 2. June 2017.

Transition to the digital economy is accompanied by a few global trends:

- geo-economic (low rates of economic growth, growth of social inequality, acceleration of regionalization);

- demographic (growth of world population, increase in the share of older people, the "digital" generation entry into the labour market);

- technological (robot automation, digitalization of business processes);

Innovation, digital lifestyle, introduction of new information programs and technologies, change of the technological era - these are the processes which are developing exponentially. We should be ready for radical changes in the future already in the present.

The fourth industrial revolution forms a world in which virtual and physical systems interact with each other, spreading to a variety of areas: renewable energy resources, decoding information contained in human genes, nanotechnology, quantum computing. Digital technologies are becoming increasingly integrated, leading to the transformation of society and the global economy. The second and third technological revolutions are still spreading in a number of countries. Thus, 17% of the world's territories (1.3 billion people) still do not have access to electricity - the result of the second industrial revolution, and half of the world's population (4 billion people) do not have access to the Internet, which marked the third industrial revolution [4].

Creating benefits for consumers, the fourth industrial revolution creates problems in the world of labour production, exacerbating inequality. In developed and rapidly developing countries like China, the share of labour in GDP has decreased due to a decrease in the relative price of the means of production. Society is facing the need to sign a new social contract, creating a system of common values that will turn the fourth industrial revolution into a condition for the growth of opportunities and well-being for all members of society. The need to regulate employment in the new conditions is becoming more urgent, because as it was noted in the first third of the twentieth century by J. Keynes, the emergence of technological unemployment, due to the fact that the discovery of ways of economical use of labour, will turn into a mass phenomenon.

There exist great difficulties in the global labour market: the problem of employment, growth of mass unemployment worry most of both developed and developing countries. According to the International Labour Organization (ILO), in 1999 there were about 120 million officially registered unemployed in the world, of which 34 million lived in developed countries. At present, according to unofficial data, the number of unemployed is estimated by experts at 820 million, which is almost a third of the total working-age population of the planet. In the early 1990s, the highest unemployment rates were recorded in industrialized countries: South Africa (48.0%), Spain (22.4%), Finland (17.7%), Ireland (17.6%) [5]. The situation on the global labour market is also complicated by the fact that among people who have a job, there is growing uncertainty about the stability of their jobs and incomes, as mergers and intense competition force companies to modernize enterprises. Hiring and firing employees, depending on the needs of the market, fully satisfies companies engaged in increasing profits, but creates significant barriers to the realization of universal human right

— the right to work. This problem has significantly worsened during the crisis of 2008–2009 and the subsequent recession. Young people especially have difficulties in the labour market (see table 2).

TABLE. 2. Unemployment rate (%) to economically active population)

Indicators	2009	2010	2011	2012	2018	Youth unemployment
Russia	8,4	7,5	6,6	5,7	5,2	16,35
Germany	7,8	7,1	6,0	5,5	3,7	6,77
Italy	7,8	8,4	8,4	10,7	11,2	34,73
Spain	-	-	25,0	27,4	17,2	38,75
Canada	8,3	8,0	7,5	7,2	6,3	11,61
United Kingdom	7,6	7,8	8,0	7,9	4,3	12,08
USA	9,3	9,6	9,0	8,1	4,4	9,18
France	9,5	9,7	9,6	10,3	9,4	22,14
Japan	5,1	5,1	4,6	4,4	2,8	4,62

Sources: 1) Rosstat: www.gks.ru;
 2)<https://www.economicdata.ru/country.php>

The gap between the haves and have-nots, the knowledgeable and the ignorant, those who have access to the information highway and those who do not, is growing. There are mass social contradictions between new highly paid workers and laid-off workers, whose knowledge in the digital economy has become uncalled. Deep contradictions within the organization are brewing: workers are urged to work hard for the good of the company, but they do not participate in the division of material benefits that they themselves create. The problem is exacerbated by mass migration between countries and continents. According to the calculations of the World Bank, an increase in number of migrants by only 0.5% lowers the wages of the native population by 1%, that is, twice. All this creates conflicts and threats to personnel and economic security.

Uncertainty in the labour market is increasing, as it is difficult to determine how many workers in routine occupations have been replaced by robots and how quickly this will happen. The displacement of workers by automated production can be offset by increased employment to meet growing demand. Labour is replaced by innovations in various industries and professions. About half of the existing 702 professions can be automated in the next twenty years [6]. Employment will grow in high-yield creative work as well as in low-income manual labour, but will decline in middle-income monotonous standard occupations.

In the foreseeable future, the demand for professions increases, allowing decisions to be made in the face of uncertainty and the development of new ideas. With rapidly changing working conditions, it is important to acquire personnel with the ability to anticipate new trends in employment, to provide employees with knowledge and skills that enable them to adapt quickly.

B. Digitization of the economy has many economic and social benefits. To stimulate the acceleration of the digital economy, economic growth is needed in the country. The new quality of growth is determined by the aggregate capital of the nation: natural, economic, human and social, which are interconnected. In the modern world, special emphasis is made on human capital as a factor of economic growth and progressive development. Introduction of new information programs and technologies, the problem of big data analysis (BigData), transition to technological structure, emergence of Blockchain technologies, the Internet of Things (IoT), makes us think differently about human resources and knowledge.

According to the UNDP, in 2017, Russia with an indicator of 0.816 was included in the group of countries with a high human development index, which is significantly higher than the world average value - 0.728 [7]. However, taking into account in-country inequality, the indicators decrease to 0.738 (see table 3).

TABLE. 3. Dynamics of the Human Development Index

No	Country	1990	2000	2010	2014	2016	2017	2017 *
1	Norway	0.850	0.917	0.942	0.946	0.951	0.953	0.876
5	Germany	0.801	0.868	0.921	0.930	0.934	0.936	0.861
13	USA	0.860	0.885	0.914	0.918	0.922	0.924	0.797
19	Japan	0.816	0.855	0.885	0.903	0.907	0.909	0.876
49	Russia	0.734	0.720	0.780	0.807	0.815	0.816	0.738
79	Brazil	0.611	0.684	0.727	0.752	0.758	0.759	0.578
86	China	0.502	0.594	0.706	0.738	0.748	0.752	0.643
130	India	0.427	0.493	0.581	0.618	0.636	0.640	0.468

*Note. Taking into account the intra-country inequality

Direction of information technology development is inextricably linked with education and development of human resources. According to the methodology by J.Rasmussen, the total number of people employed in economics is divided into three groups: "Knowledge" (high qualification, cognitive challenges), "Rule" (medium skill level, cognitive routine tasks), "Skills" (basic education level, mechanical tasks). A critical indicator for countries with developed digital economies is the share of employees in the category "Knowledge", which is more than 25% (USA, Japan, Germany, Singapore, UK).

A study conducted by the BCG-group (October 2017) [8] shows that in Russia only 17% of specialists (scientists, IT-engineers, doctors, teachers, managers) belong to the first group and have highly developed competencies. The main share of 48% of employees (accountants, lawyers, office administrators) is in the second group, and 35% are low-skilled labour (salespeople, security guards, cleaners, drivers, etc.), which at this stage of development does not allow entering group of countries with developed digital economies (Fig.1).

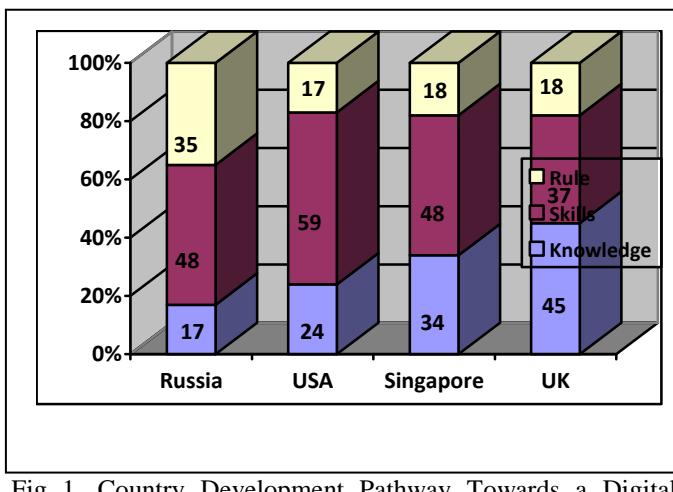


Fig 1. Country Development Pathway Towards a Digital Economy (White box – “Rule”, red box – “Skills”, blue box – “Knowledge”)

Transformation of employment forms and the labour market requires the development of new universal competencies in demand in the digital economy. The generation “Z”, today's university students, will enter the labour market in 3-5 years and by 2025 will make up about a quarter of the total labour force. With the development of the information society and the digital economy, professions are becoming more complex, the requirements for young professionals are changing: first, digitalization contributes to the release of time to solve more complex and creative tasks; secondly, the requirements for the level of qualification and set of competencies are increasing.

On the basis of expert analysis, the Target Model of Universal Competences 2025 [8] was developed. It focuses on the formation of: 1) digital; 2) cognitive, 3) social behavioural competencies.

Digital skills include the ability to manage information, development of digital culture, knowledge of the basics of programming, ability to use professional digital tools. In the modern world, a practice-oriented approach to learning is being formed from the school days and at the university. It allows you to quickly navigate the virtual environment, find the right information, make electronic transactions, save time and money. The generation “Z” spends more time in the virtual world than in reality. New digital technologies provide new opportunities for analyzing big data, computer vision allows you to automatically process a huge number of images, photos, find the desired object, etc. Digital competencies are necessary for all professionals, both in technical and humanitarian professional fields. For economists, the use of digital technology, quick analysis of big data allows us to prepare a realistic economic forecast, which is based on the most customized consumption model. Professionals in the field of media, communication and design are required to use graphic editors and other digital tools.

Social and behavioural competencies include communication, tolerance, interpersonal skills, cross-cultural interaction. A modern set of student competencies offers knowledge of foreign languages, a broad outlook, mobility. For the generation “Z” values of personal growth, balance of work and personal life are more important than financial opportunities and career.

Cognitive competencies develop with the acquisition of experience: adaptability, solving non-standard tasks, focus on results, self-development, organization, management skills, emotional intelligence, self-development focus, entrepreneurial skills, achievement of results, intercultural interaction. In the information economy based on knowledge, the role of a person as an individual, which is the carrier and creator of new knowledge, is growing.

Qualitative changes in the economy and society are associated with increasing changes in the most profound foundations of social organization — the content of labour. A gradual non-linear but powerful increase in the role of creative activity leads to changes in both the factors of production (the role of knowledge and culture increases) and its structure (the role of education as the first division in the new economy) and the subject (a creative person replaces the economic man). All these changes create positive and contradictory prerequisites for the future society of mass creative activity, creating a world of culture, and form a digital economy. The emphasis on the creative content of activities as a key element of the digital economy allows us to postulate its innovative nature, based on the creation and implementation of innovations, that is, on creative activity in the field of production, management, education. In the digital economy, consumption time and labour time are combined, especially for people engaged in mental and creative labour. This is due to the fact that information technologies fill the entire information space of an employee with information processing activities [9]. Free time for all members of society from pure leisure time turns into a period of ever-longer training, continuous education and self-education, and re-qualification throughout the entire life cycle.

IV. CONCLUSION

A. Development of new competencies, formation of professionals in the “Knowledge” category make the foundation for the competitiveness of the country, business and population in the digital economy. Lifelong learning should be an imperative of a modern man.

B. To make transition to the digital economy, the government must facilitate people's transition to a new job and fairly distribute the benefits of this transition. To facilitate the transition to a future labour market, generous unemployment benefits, retraining and employment must be paid. High turnover of personnel of the company should increase the cost of retraining. It is necessary to increase investment in professional training.

C. Thus, in the digital economy, human capital requirements are changing dramatically. Any effective activity depends on each individual person, on his/her contribution, behaviour, attitude to the task, incentives and motivation, sources of information [10]. The rate of change is so high that

it requires young people to form universal competencies of the 21st century, to master new knowledge and skills, so as not to be among the uncalled people and confidently step into the digital future.

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