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**HUMAN CAPITAL IN DIGITAL ECONOMY: MODERN TRENDS**  
**AND INNOVATIVE DEVELOPMENT OPPORTUNITIES**

R. M. Ustaev (a)\*, V. N. Parakhina (b), E. Patrick (c), E. N. Novikova (d)

\*Corresponding author

(a) North-Caucasus Federal University, ul. Pushkin, 1, Stavropol, Russia, 110213rabota@mail.ru

(b) North-Caucasus Federal University, ul. Pushkin, 1, Stavropol, Russia, vparakhina@ncfu.ru

(c) INTAMT - International Academy of Management and Technology, Alt-Pempelfort, 15, Düsseldorf, Germany, 40211, patrik@intamt.de

(d) Branch of Kuban State University, ul. Komsomolskaya, 126, Armavir, Russia, novikovakatya\_06@mail.ru

***Abstract***

The article emphasizes the importance of digital economy in gradual transition to a brand new level of the use of information technologies in all spheres of industrial and public life. Analysis of the current state of digital economy in the Russian Federation in relation to the world's leading countries in this area is carried out. The role of human capital in the formation of digital economy has been revealed with the rationale that the development of organizations during the period of transition to a digital economy is inextricably linked with the ability to effectively manage human capital. The main achievements of the Program for the development of the digital economy of Russia and expectations and the results desired from the implementation of the Program are provided. The results expected from the development of the digital economy while implementing the Program "Human Capital and Education", which implies quality growth and improving living conditions of the citizens of the country and is focused on a qualitatively new level of the country advancement are given. The objectives of educational institutions within the framework of personnel training for work in digital economy industry are described. The main factors of slowing down innovation activity and the development of modern information systems and the knowledge economy in Russia, are highlighted. Common problems in the implementation of the digital economy and directions for their minimization are named. Recommendations for the successful implementation of innovative programs of the development of the digital economy of Russia are given.

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**Keywords:** Digital economy, education, human capital, innovative development of the country.



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## **1. Introduction**

The meaning of the digital economy in global transformations which changes the business development models fundamentally, and orientation to the transformation of the modern economy towards its digitalization (last year the Government of the Russian Federation approved the Digital Economy Development Program in the country, which includes significant changes in the field of legislative regulation of the use of digital technologies and solutions, improvement of the system of personnel training in the education system, creation of specialized digital infrastructure and improving information security, also the program of the National Technology Initiative is being gradually developed), adds significance to this study. In addition, it is important to note that the use of digital technologies will make it possible to develop telemedicine, online learning, unmanned vehicles, smart home systems and the Internet of things. At the same time, it is important to remember that without the innovative approach of human capital, digital economy is simply untenable; therefore the development of the innovative potential of human capital in the modern economy remains essential.

## **2. Problem Statement**

Sustainable innovative development of both the entire economy of Russia and its regions in the conditions of the emergence of digital economy is inextricably linked with the formation, effective use and development of human potential.

The appearance of new processes induced by the influence of globalization, and completion of industrial economy with its digital component, reforms in the public administration system in Russia, lead to the emergence of qualitatively new phenomena that require research of both fundamental and applied nature.

In the works of researchers and practitioners (not only domestic, but also foreign) practically no significant attention was paid to the problem of ensuring the innovative processes of formation, application and development of human capital involved in the digital economy. And here, it is important to identify current trends and possibilities of this issue in relation to innovative development.

## **3. Research Questions**

**3.1. What is the current state of the digital economy in the Russian Federation in relation to the world's leading countries?**

**3.2. What is the main role of human capital in shaping the country's digital economy?**

**3.3. What factors slow down the innovative activity of human capital and the development of modern information systems as important indicators of Russian digital economy progress?**

**3.4. What are the main directions of successful implementation of innovative programs in the development of digital economy of Russia?**

#### 4. Purpose of the Study

The rationale of the importance of human capital in the development of digital economy of the Russian Federation.

Research into the current state and trends of the development of digital economy of the Russian Federation.

Defining the factors that slow down the innovative activity of human capital and components of Russia's digital economy.

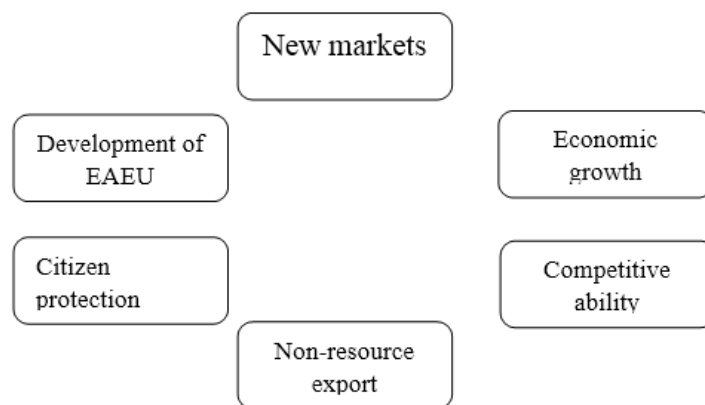
Characterization of common problems in the implementation of digital economy, ways of their minimization and successful realization of innovative programs.

#### 5. Research Methods

The methodological basis of the study was the systemic and process approaches to the study of human capital in the digital economy of the country. In this study, we used: dialectic; inductive methods, as well as structural and comparative analysis and synthesis.

#### 6. Findings

From the point of view of the state, digital economy ensures the realization of national interests presented in Figure 01 (Bublik, Lukina, Chuvilin, Shafikov, & Unusova, 2018).

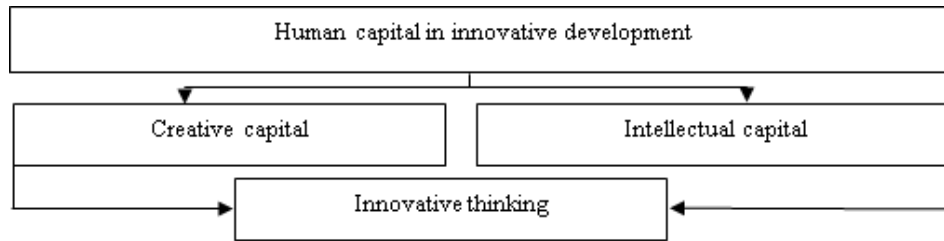


**Figure 01.** National Interests in Digital Economy

Digital economy in the Russian Federation, in conformity with special Program adopted in 2017, focuses on and complements the goals and objectives of the national technology initiative, which, in its turn, serves as a basis for understanding of advanced technological solutions and strategic forecasting of their development aimed at ensuring national security, growth of the quality of life of the population, development of new technological paradigm industries (Shed'ko, Vlasenko, & Kunbutaev, 2018).

Today, the priority of the state is transition to an innovation-oriented economy, achieved through the effective use of its own economic potential (Ustaev, 2016). Human capital is an important component

in the structure of national wealth and is formed from a number of structural elements, as shown in Figure 2 (Parakhina, Boris, & Timoshenko, 2017).



**Figure 02.** The components of human capital in innovative development

Innovative thinking plays a special role of direct productive force and the main productive resource. It is a fundamental basis of the new economy. It is no coincidence that in searching for a new balance in the global economy, in studying the dynamics of the global economy and technologies that change reality, special attention is always paid to human capital as a key vector of development. Innovative ideas are gaining importance through in-depth analysis and intellectually intensive inventions. Current interest in innovation is the result of investing huge amounts of money in scientific and innovative research and development. The latest advances in science and technology aimed at creating products with unique properties and those that allow to reduce expenditures and production costs are becoming necessary.

Creativity and innovation in decision-making is becoming not just the most important component of the economic development of territories, but also serve as the basis for many economic and socio-cultural processes. Within the framework of digitalization and innovative development of the economy, the competitiveness of a socio-economic system is determined by its intellectual capital (Borzunov, 2017).

Thus, today we can confidently claim that without human capital, and intellectual capital in particular digital economy is simply untenable. If there is no proper number of specialists in the field of IT-technologies, there will be no digital economy itself. At the same time, analyzing the degree of development of digital economy in Russia, it is worth noting that today our country is not rated among the leaders in this sphere of economic development by a number of criteria, namely:

- level of digitalization;
- share of digital economy in total GDP;
- share of the average level of delay in mastering technologies used in the leading countries.

The share of digital economy in Russia's GDP is about four percent, which is two to three times lower than that of the leading countries. However, already at this stage, a positive trend towards the development of digital economy is noticeable in Russia. Thus, the share of digital economy in recent years tends to grow rapidly. For example, over the period of 2011-2015 (pre-sanction period) the country's GDP had grown by 7%, and the volume of digital economy had increased by almost 60% (1.2

trillion rubles) in prices of 2015. Thus, over those four years, the digital economy accounted for about 25% of the total gross domestic product growth (Retailing in Russia / Euromonitor International, 2018).

Over the past few years, our country has managed to create fairly large digital companies out of almost nothing. A number of them are internationally known. These include the largest independent online bank Tinkoff Bank, which has no physical branches, digital portals and ecosystems of Mail.ru and Yandex services, Avito electronic announcements, and V Kontakte social network.

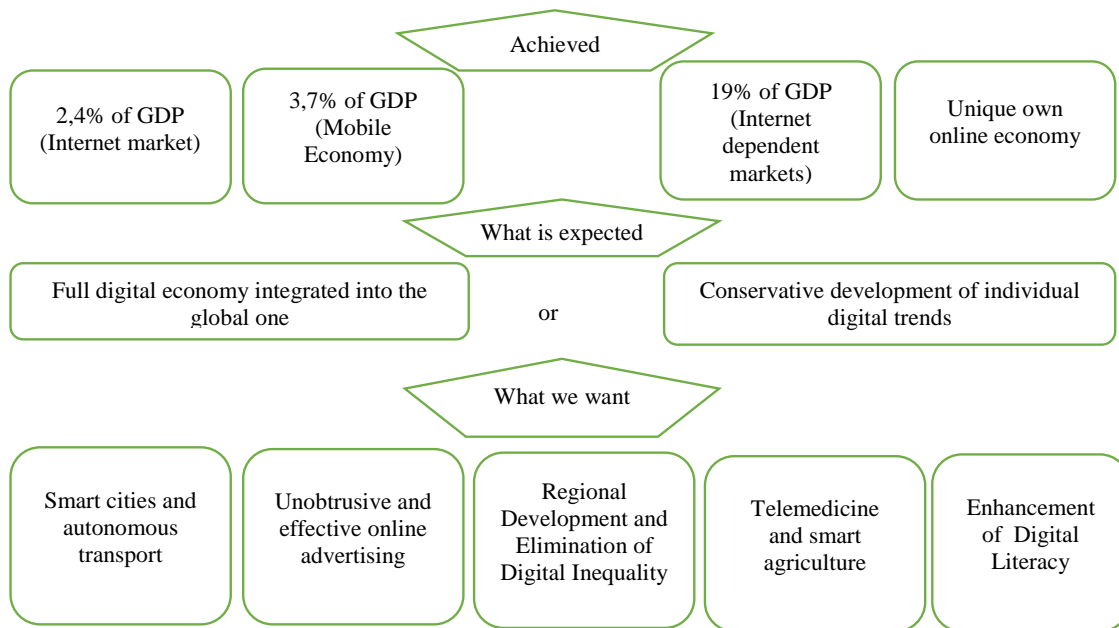
In April 2018 the Legislative Council raised the issue of regional budgets enhancing and providing them with additional transfers necessary for the development of digitalization. The Council for Digital Economy Development is planning to work out a unified methodology for assessing the quality of digital economy development in the regions of the Russian Federation. Ratings for the level of development of digital economy will be created (Turchak, 2018).

Analyzing the level of digitalization development in private companies it is worth noting the fact that Russia is lagging behind the leading countries. The modern private sector makes relatively little use of the advantages that digital technologies embracing open up to consumers. Investment into the application of technological advances, in the increase of productivity and creation of new products and services is at a rather low level. Thus, the volume of investments of private companies in digitalization is still only 2.2% of GDP. At the same time, in the USA it reaches 5%, in the countries of Western Europe - 3.9%, in Brazil - 3.6%. Growth of competitiveness of domestic companies is relatively low even at home, not to mention international scale (a small amount of high-tech exports) (Retailing in Russia / Euromonitor International, 2018).

In addition, a relatively low level of investment from customers of digital solutions reduces the opportunities for the development of Russian companies that provide digital solutions, since it is the domestic market that is the first step for the growth of future digital industry leaders.

Thus, there is a noticeable lag of Russia in the field of digitalization of economy from the countries leading in this field, however, potential opportunities for the effective implementation of the Digital Economy Development Program in our country, in addition to effective foreign experience, are the ever-growing needs of the population, as well as recent active development of the Internet and IT technologies (Keshelava, Budanov, & Rummyantsev, 2017).

The analysis of the Digital Economy Development Program allows us to identify the most important general areas that have already been achieved by our country, what awaits us and what we want to achieve (Figure 3).



**Figure 03.** The main areas that have already been achieved, what is expected, and what are the desired results from the implementation of Digital Economy Development Program of the Russian Federation

To uphold its international status and adhere to modern technologies of the world industry development, it is important for Russia to define and initiate gradual implementation of our own digital economy system, which means creating the necessary infrastructure (Golovina, Polyanin, & Rudakova, 2017).

Digital economy is not aimed at ousting primary and secondary industries in Russia, but is targeted at helping these industries to function more efficiently and effectively through the introduction of information technologies that can reduce overall costs. However, the digitalization of economy will have certain impact, both positive and negative, on the human capital in the country as a whole. Among the risks and potential threats for human capital in Russia that may arise with the widespread introduction of digital economy we can name the following ones:

- rise of unemployment, triggered by the release of a certain number of workers, due to the introduction of new technologies;
- inability of the majority of employed personnel to learn and retrain;
- gap between available and necessary expertise;
- a limited number of educational institutions capable of solving the problem of personnel training and retraining (Golovina et al., 2017).

As practice shows, the qualification level of managers responsible for innovation development is critical for the effective pursuit of activities (Solovyova, 2011). Entrepreneurs are interested in training of qualified staff: since high-tech products can be made only by highly qualified specialists.

Thus, successful implementation of innovative programs in the development of the country's digital economy is possible by way of:

- paying particular attention to recruitment for work in teams that implement core startups;
- assessing the ability and readiness of personnel departments of organizations planning the implementation of start-ups;
- organization and competent implementation of further building up of necessary professional expertise of the staff;
- intensification of work with specialized universities;
- carrying out training and certification of specialized business coaches on the basis of the country's leading universities (Vlasenko, 2015).

These areas are focused on improving one of the eight priority components of the Digital Economy Development Program “Human Capital and Education”. The systemic mechanism for the development of staff available in the Program allows to expect a significant increase in the efficiency of the labor activity of the economically active population of the country (Table 01).

**Table 01.** The results of building up a digital economy in respect of "Human Capital and Education" in 2025

Result	Characteristics
Specialized scientific basis	The functioning of a network of alliances for the collective use of digital devices and scientific equipment
Attractive environment for the work of IT-specialists	Improving the regulatory framework, improving the technological socio-economic platform for testing current research results
By the end of the period, the issue of retraining and training for the digital economy has been fully resolved.	By the end of the period, the issue of retraining and training for the digital economy has been fully resolved.
Building up of the expertise for the digital economy with the help of educational programs, as well as the formation of a system reflecting the gradual development of expertise	Such educational principles as: personal approach, combination of educational and labor vectors of development, etc. are meant to be taken into account.

Thus, as soon as Russia achieves the goals set it will be able to reach a new level of development and the growth of the quality of the standard of life of its citizens. It is assumed that digital economy will impact 26 million jobs, six million of which will disappear completely, and the rest will be subject to new demands, induced by the innovative development of the country. But it is important to have specially trained workers with necessary expertise for the development of the labor market, and they will be trained by specialized institutions that will help them master digital education programs (Golovina et al., 2017). At the same time, in the conditions of dynamically developing science and technology, education system faces two major problems: “what to teach” And “how to teach”.

To find the correct answer to the question “what to teach”, active interaction of employers with educational institutions is necessary. Training programs should be organized with the close involvement

of employers who understand what knowledge and skills graduates of educational institutions should possess. The most important step in this direction is to work out professional standards and systematically update them.

The answer to the didactic question “how to teach” has become particularly relevant due to the changing paradigm of vocational education development caused by the sharp increase in demand for qualified specialists in modern economy, widening of the range of offers in the market of educational services, increasing demands of students for the quality of education received which influences their competitiveness in the labor market, and changing of the role, functions and tasks of vocational educational institutions in modern society.

In this regard both the formation of relatively new expertise of workers, and raising the efficiency of educational process are necessary for the development of the labor market.

It is important to note that now there are a number of significant achievements for the training of personnel for digital economy. For example, the National Center for Digital Economy, created at the Moscow State University named after M.V. Lomonosov, and the company "Tsifra" signed an agreement on cooperation in training of promising workers for the purposes of the program "Digital Economy".

According to this agreement, it is planned to implement integrated programs for digitalization of production industries and to develop joint projects in the formation of regulatory documents for the future subprogram “Digital industry” (The program “Digital economy of the Russian Federation”, 2017).

Specialists from National Centre of Digital Economy of Moscow State University and Tsifra will develop training courses and programs on various aspects of the development of digital economy together and use these courses to train specialists through digital educational platforms. Moreover, it is planned to invite experts from both sides to deliver lectures and read special courses, to organize master classes and internships.

The objectives of educational organizations in training specialists for digital economy should be:

- growth and improvement of digital literacy;
- creation of human resource forecasting systems related to the needs of key industries by education / retraining system;
- organization of educational process with the involvement of leading experts in the field of digital economy;
- reducing the gap between theories and practice through more active involvement of IT companies.

Competence models, according to the needs of digital economy, must be strictly regulated by an independent body of authority, since any innovation requires new capabilities.

Among important factors of innovation activity reduction and inhibition in the development of modern information systems the following ones can be identified:

- priority in the development of the primary industry, rather than knowledge-intensive ones;
- significant underestimation of human capital;



- targeting at short-term goals;
- breach of the continuity of scientific and technical knowledge (Boris, Kuzmenko, Lepyakhova, & Parakhina, 2018).

Thus, the level of development of Russian “digital” economy still has relatively low indicators of competitiveness, although, it is worth noting, its recent establishment and the development potential. Attachment to the primary industries model of the Russian economy can be identified as the main reason for the weak innovation activity and slow development of modern information systems (Parakhina, Ustaev, Boris, Maximenko, Belousov, 2017), despite the attempts of the government to develop secondary industries, including knowledge – based economy.

Today, the majority of representatives of small and medium businesses still have problems with access to modern scientific and technological achievements. That is why an important task of the government is to eliminate or significantly reduce the existing barriers that limit access to modern achievements in the field of scientific and technological development, as well as to ensure the most favorable conditions during the transition period to a knowledge - based economy. Each developing country will be able to move to sustainable balanced economic growth owing to orientation towards the scientific and technical advancement, mastering and effective introduction of modern technologies, development of knowledge-intensive high-tech industries, and the sphere of education. The primary industry economy cannot solve such problems because of its finiteness and focus on resources (Shed'ko et al., 2018).

If we talk about general problems of the implementation of digital economy, there remain unresolved issues related to the assessment of the results of the realization of digital economy opportunities in individual industries, regions and even social groups of population. How will technologically underdeveloped sectors of economy fit into the newly formed value chains? What will happen to the employment of the population of territories far from the digitalization process? How much will the importance of transnational corporations in the functioning of national and regional economies increase? At the moment, all these questions refer to the future and do not have any definite answer. To find the answer, it is necessary to undertake a large-scale research aimed at thorough understanding and systematization of the processes taking place, as well as at preparing sound solutions to the emerging challenges and threats.

## **7. Conclusion**

It is safe to say that digital economy has already come to Russia, and in 10 years it will dominate. During this time, each of us needs to decide how to meet the expected changes, how to build the process of change management effectively: with the accumulated innovative skills or with a set of old knowledge and skills.

It is important to remember that in order to achieve the main goal of the Digital Economy Development Program, as an essential element for ensuring competitiveness and prospects of companies, industries and national economies, it is vital to form a developed and effectively functioning research and development sector.

The findings of the study are highly demanded, provide a holistic view of the conditions of formation, use and development of Russia's regional human potential for digital economy, and are aimed at developing and strengthening the links between science and business, improving scientific research, developing creative abilities of employees and successful introduction of innovations in the framework of digitalization process. It is important to accelerate the pace of digitalization and by 2025 achieve an ambitious, but quite realistic goal - to triple the size of the digital economy.

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