Intellectual Governance in the Digital Economy of Russia

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Abstract—The article analyzes the role of artificial intelligence in the success of the digital transformation of the Russian economy. The article shows the worldwide recognition of artificial intelligence as a leading trend in economic development in modern conditions, recorded in the national strategies for the development of artificial intelligence of economically developed world powers. Russia is one of these countries. A review of national strategic documents that are programmatic in the development of the digital economy and artificial intelligence in Russia. In the list of end-to-end technologies of the digital economy, artificial intelligence is defined as the key one. Definitions of artificial intelligence are given, proving the ambiguity of its interpretation in science and practice. A list of the main tasks of the development of artificial intelligence in Russia as a trigger for the formation of the digital economy is given. The assessment of the susceptibility of the heads of Russian companies to the use of artificial intelligence technologies is given. The promising directions of development of artificial intelligence and areas of its application are revealed. Particular attention is paid to the positive opportunities that artificial intelligence, used in the management of modern companies, brings with it. At the same time, the author emphasizes the influence of artificial intelligence on a radical change in management processes, the nature of labor and the specifics of interactions in the "man-machine" dyad. The article provides a list of personnel competencies required to work in the context of the Fourth Industrial Revolution. Emphasizing the irreversibility of digital transformations, the authors, along with revealing the positive aspects of integrating artificial intelligence into the management of companies, also point to potential threats from digitalization. The conclusion is made about the need for an integrated approach to assessing the problems in the field of artificial intelligence and taking preventive measures to protect against the onset of negative consequences that can neutralize all the positive effects of technological progress.

Keywords—artificial intelligence, digital economy, management, economic processes

I. Introduction

The global society has entered a new stage of economic development called the digital economy. With all the relevance of the digital goods generated in the new model of the economy, there is no single interpretation and, therefore, no understanding of what the digital economy really is: it is also interpreted as an economy based on the large-scale penetration of digital information and communication technologies into all economic processes and as an economy that makes it possible to create, consume and manage value in the form of digital products and services associated with the assets of organizations, as well as use the possibilities of online and innovative digital technologies by all actors of the economic system – from individuals to large business entities and entire states. The OECD equates the digital economy with markets in which trade in goods and services is organized using digital technologies, i.e. e-commerce is carried out. The World Bank views the digital economy as a new paradigm for accelerated economic development – this definition is the basis of this author's article. Artificial intelligence is considered to be a generally recognized trigger of the digital economy, with the help of which progressive companies are switching to intelligent management of their business processes, which makes it possible to: accelerate the analysis of the company's activities, provide timely information for making management decisions and making forecasts, and efficiently solve business problems with saving working time, etc.

II. Problem Statement

Recognizing the digital economy as a driver of sustainable socio-economic development of the country, it is necessary to determine the necessary conditions for its growth based on the interest and involvement of all actors in digital economic

activity. The growth of the digital economy should be ensured in accordance with the adopted national documents in the field of digital development, through the development of the national information technology sector, comprehensive support for the generation of innovative technologies and collaboration of all stakeholders. It is necessary to stimulate investments in the digital transformation of the economy and entrepreneurial activity in the field of innovation. According to the Program "Digital Economy of the Russian Federation", adopted in 2017, artificial intelligence is rightly considered a trigger for the digitalization of the economy, the impact of which will primarily affect not the amount of jobs, but the content of labor operations. This, in turn, complements the list of competencies of modern specialists and sets new tasks for transforming their consciousness in preparation for fundamental transformations. Intelligent management of digital processes in no way excludes human employment – it expands the capabilities of personnel through cooperation with artificial intelligence and makes it possible to solve problems that were previously considered beyond human control.

III. RESEARCH QUESTIONS

In the context of the transition to intelligent management of digital transformations in Russia, the vector of attention is increasingly shifting towards the search for a mechanism for embedding artificial intelligence in economic processes. It seems important to assess how the new digital reality and its determining factor – artificial intelligence – fit into national strategic documents to solve the set tasks for the intellectualization of the economy, which give Russia a resource for entering the world technological elite. In addition, you should know which promising areas of artificial intelligence development should focus the attention of scientists and practitioners, what benefits and potential threats are hidden in this phenomenon.

IV. PURPOSE OF THE STUDY

Despite all the obviousness of a sustainable vector for the digitalization of the economy and its intellectualization, economic science is in a state of solving problems that provide a reliable toolkit for managing transformation processes. The purpose of the study is to identify the role of artificial intelligence in the success of the digital transformation of the Russian economy. The authors set the following tasks to achieve this goal:

1) to analyze the strategic documents defining the national strategy for the development of the digital economy and artificial intelligence in Russia;

2) to determine the advantages inherent in the potential of using artificial intelligence technologies in the management of economic processes;

3) to identify potential threats posed by artificial intelligence.

V. RESEARCH METHODS

The research used the methods of theoretical and statistical analysis, inductive-deductive methods, abstraction, and formalization. The statistical analysis is based on data from the Analytical Center for the Government of Russia, VTsIOM (The All-Russian Public Opinion Research Center), experts from the Higher School of Economics and international consulting companies Boston Consulting Group and Gartner. Author's interpretation of the results of scientific research by Russian and foreign scientists provided a depth of analysis of the scientific problem.

VI. FINDINGS

Artificial intelligence is rightly recognized as one of the trend directions in the development of all leading economies of the world, the development of which is associated with the implementation of strategic tasks of national development and world domination [1]. Thus, more than 30 states (Denmark, Canada, China, Singapore, France, etc.) have adopted national strategies for the development of artificial intelligence. There is a sharp increase in investments in artificial intelligence technologies: for the period 2014-2017 it grew threefold and reached almost $ 40 billion [2]. Countries whose government does not pay due attention to the introduction of artificial intelligence into economic processes run the risk of being outsiders of technological progress. The global market for technological innovations generated by artificial intelligence will be taken by the countries that are the first to recognize the prospects and realize the competitive advantages that artificial intelligence technologies bring. Russia should take its rightful place among the leading technological powers, not missing a chance for a technological breakthrough.

A number of national strategic documents have been adopted to achieve this result, one of which is the Decree of the President of the Russian Federation dated May 7, 2018 No. 204 "On national goals and strategic objectives for the development of the Russian Federation for the period until 2024". The document sets out 9 national goals, to achieve which 12 national projects (programs) are directed, one of which is the national program "Digital Economy". It combines 6 Federal projects: "Normative regulation of the digital environment", "Personnel for the digital economy", "Information infrastructure", "Information security", "Digital technologies" and "Digital public administration". Within the framework of the Federal project "Digital Technologies", it is planned to increase internal costs for the development of the digital economy from all sources (in terms of share in the country's GDP) by at least 3 times compared to 2017, and tasks are set, including the creation of an integrated system financing projects for the development and (or) implementation of digital technologies and platform solutions, including financing and other development institutions; creation of "end-to-end" digital technologies mainly based on domestic developments [3]. The attention paid to "end-to-end" technologies (Fig. 1) is determined by their prospects, the ability to radically change the current market situation or contribute to the formation of new markets.

Singling out one of the key technologies from the list of end-to-end technologies – artificial intelligence, we consider it important to dwell on the definitions of this phenomenon. Artificial intelligence is interpreted from different positions – for example as: science and technology for the development of intelligent computer programs and the creation of intelligent machines [4]; the characteristic of intelligent systems to carry out creative operations traditionally considered a human function [5]; "a set of technological solutions that allows simulating human cognitive functions (including self-learning and search for solutions without a predetermined algorithm)

and obtaining results comparable at least to the results of human intellectual activity" when performing specific tasks [6]. Key trends in the development of artificial intelligence lie in the field of computer vision, speech recognition and synthesis, natural language processing, and the creation of intelligent decision support systems. These directions are fixed in the National Strategy for the Development of Artificial Intelligence until 2030 in the Russian Federation, approved by the decree of the President of the Russian Federation dated October 10, 2019 No. 490. This strategy also defines the main objectives of the development of artificial intelligence in Russia.
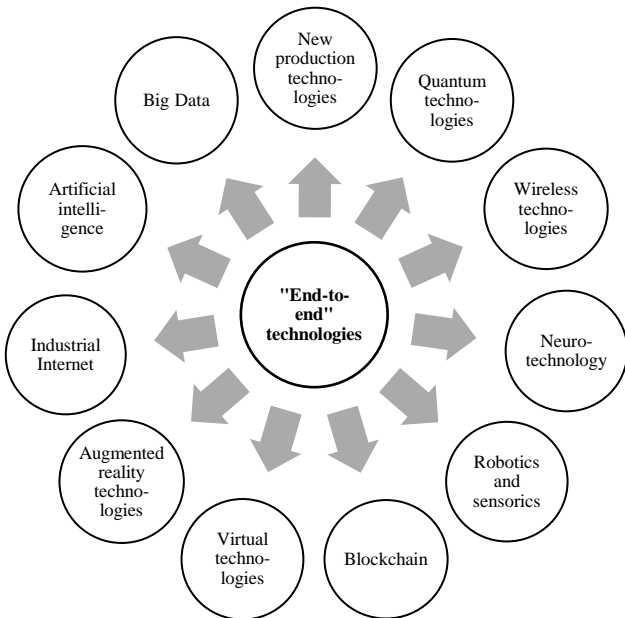

Fig. 1. End-to-end technologies of the digital economy

First, it is necessary to ensure the advanced development of artificial intelligence, and this requires comprehensive support for promising scientific research. Secondly, it is necessary to create and develop domestic software based on the use of artificial intelligence technologies and fully meeting the needs of the customer at the level of world analogues. Thirdly, it is necessary to improve the availability and quality of data that ensure the development of artificial intelligence technologies. Fourth, it is necessary to increase the availability of hardware used in solving problems associated with promising directions for the development of artificial intelligence. Fifthly, it is necessary to increase the level of provision of qualified personnel for the national market of artificial intelligence technologies, as well as to raise citizens' awareness of the possible areas and benefits of using these technologies. And, finally, it is required to create a comprehensive system of regulation of public relations related to the consumption of products and services developed using artificial intelligence technologies.

The solution of the set tasks demonstrates the scale and depth of penetration of artificial intelligence into all sectors of the economy and its recognition as a trigger for the formation of the digital economy. According to forecasts [7], the volume of the world market for artificial intelligence is expected to grow many times over by the beginning of 2025: compared to 2016, it will increase by 150 times and reach $ 59.7 billion (Fig. 2). With all the threats of technological unemployment

attributed to artificial intelligence, 2.3 million jobs have already been created in the global labor market in 2020 thanks to it; in 2022, 20% of those employed in intellectual work will solve non-routine tasks using artificial intelligence technologies; by 2025, 85% of transactions with customers will be carried out using artificial intelligence; by 2030, global GDP growth will make $ 15.7 trillion.
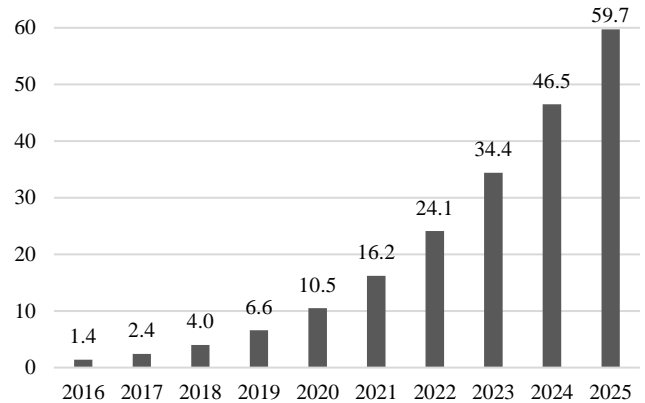

Fig. 2. Artificial intelligence market size, USD billion dollars

Artificial intelligence technologies were used in the work by 57% of Russian companies. In Russia in 2019, according to the Analytical Center for the Government of Russia and VTsIOM, the rest (43%) have never used artificial intelligence and have no plans to do so. At the same time, 91% of heads of Russian companies are aware of the existence of these technologies. The reasons for the inert attitude of Russian business to the use of artificial intelligence technologies are very different – from ignorance of such technologies to the absence of the need to use them in their work (Fig. 3).

1 – Mistrust in technology, preference for human labor
2 – Weak development of technologies in the Russian Federation
3 – Small company
4 – High cost
5 – No knowledge of artificial intelligence technologies
6 – Not needed in their field
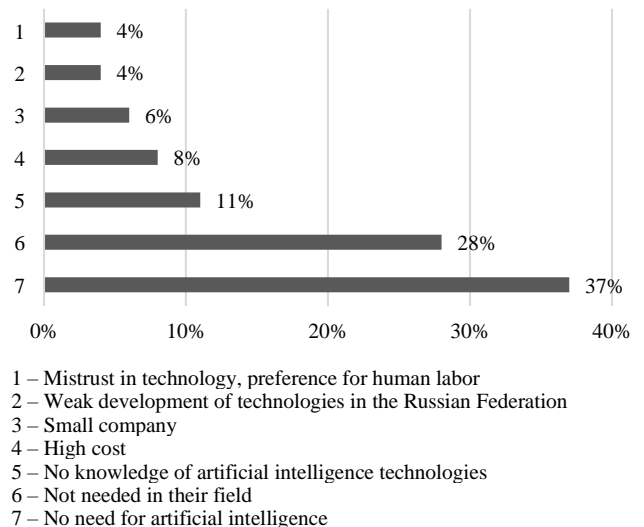7 – No need for artificial intelligence

Fig. 3. Reasons for the inert attitude of Russian business towards the use of artificial intelligence technologies

Experts note that the main reasons hindering the integration of artificial intelligence technologies into business processes are the following: the lack of visual results in the practice of Russian business, proving the effectiveness of these technologies; offerings of elite solutions available for big business and a shortage of mass products and affordable solutions in the field of artificial intelligence; lack of qualified

specialists in the market of artificial intelligence technologies (this was indicated by 69% of business representatives).

An analysis of the opinions of heads of companies with experience in implementing artificial intelligence technologies showed that 82% are completely satisfied with the effectiveness of this process, 20% noted an increase in the speed of performing labor operations, 14% – convenience and ease of work, 12% – the effectiveness of solving individual tasks, 10% – automation of processes and reduction of the number of errors made. About 8% of respondents noted the positive impact of the introduction of artificial intelligence on the growth of the company's profits, and about 6% pointed to failures and errors in the operation of these technologies, which did not allow achieving maximum efficiency from their implementation. 42% of CEOs of companies using artificial intelligence in their work or planning to implement it soon assess the risk of non-recoupment of these technologies in the future 5-10 years as minimal. This instills confidence in the development of the Russian market for artificial intelligence (Fig. 4). According to experts, its volume in 2019 should amount to $ 139.3 million[1].
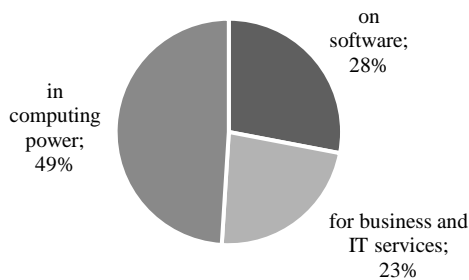
Fig. 4. Investments in the creation of solutions using artificial intelligence technologies

The main tasks, the solution of which is carried out or planned on the basis of artificial intelligence technologies (Fig. 5), is to increase the productivity of personnel and achieve the efficiency of key business processes based on minimizing costs. The first task is solved by 84% of heads of Russian companies, the second is relevant for 81%.

According to a survey conducted by the Edelman AI Center of Expertise, 91% of top executives and 84% of citizens identify artificial intelligence as a trigger for a new technological revolution. The expected effects of the use of artificial intelligence are associated with the optimization of business processes; automation and robotization of manual labor; the creation of a new architecture of employment, which will inevitably lead to the restructuring of the global labor market; a new vector of building educational processes for personalization and development of conceptual thinking; objectivity and rationality in decision making [8].

There are two promising directions for the development of artificial intelligence: the approximation of specialized systems of artificial intelligence to the capabilities of the human personality and their integration; creation of artificial intelligence through integration within a single system of existing artificial intelligence systems. Both directions are aimed at solving the problems of a global society with the

prospect of its sustainable development. The areas in which broad prospects for the use of artificial intelligence are opening up are quite extensive – these are, first of all: robotics; automatic translation; intelligent information security systems; obtaining information and business intelligence; expert systems; recognition of texts, speech, visual images; cognitive semantics and analysis of natural language texts [9].

1 – Sales process automation and recommendations
2 – IT automation (autonomous IT)
3 – Automated helpdesk
4 – Digital assistants for information workers
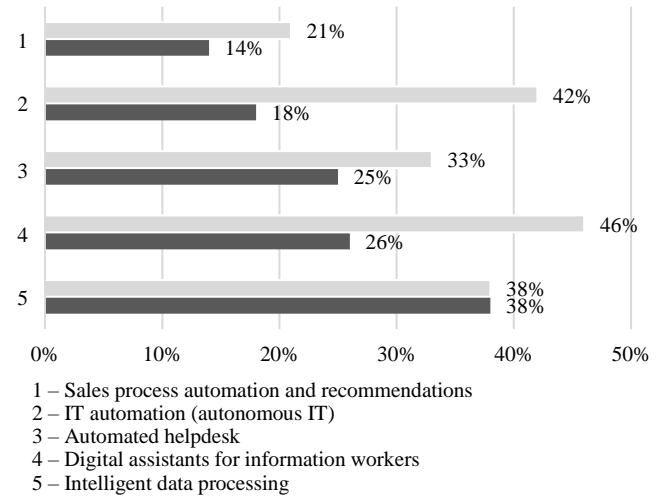5 – Intelligent data processing

Fig. 5. The main scenarios for using artificial intelligence

Scientific research and the best world experience in the implementation of artificial intelligence show what new opportunities artificial intelligence gives to companies – they significantly modernize technological and social processes and increase their efficiency, increase labor productivity, make a technological breakthrough, acquire a new competitive advantage [10]. First of all, the use of artificial intelligence is seen in connection with the reengineering of business processes – making them more flexible and adaptable, achieving the integration of advanced artificial intelligence systems and people. Artificial intelligence is also initiating the third wave of business transformation, the essence of which is machine augmentation and enhancement of human capabilities – the functionality of machines takes over the execution of repetitive, routine tasks with processing a large amount of data, and the person is responsible for working with ambiguous information, making decisions in complex situations where there is a high level of uncertainty and the need to be creative in problem solving [11]. In addition, artificial intelligence radically changes the nature of labor and the nature of human-machine interactions, restructures management processes, and forms new requirements for the list of competencies [12] that determine success or survival under the conditions of the Fourth Industrial Revolution (Fig. 6).

The rapid development of artificial intelligence, of course, is associated with both the positive results of its scaling [13], and with certain threats to the state, business and society as a whole [14]. It is important to embed artificial intelligence into the procedures and mechanisms of predictive analytics [15]. Possible problems are named from the smallest ones, for example, the invasion of "smart" toys into the personal space of a child, to global ones, which relate to a decrease in the quality of life of poor citizens or a loss of human intellectual abilitiesConsequently, the state and the business community

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[1] Artificial intelligence (market of Russia), TADVISER. Government. Business. IT, 2020. Retrieved from http://tadviser.com/index.php/Article:Artificial_intelligence_(market_of_Russia)

need to take a comprehensive approach to assessing the list, depth and scale of problems in the field of artificial intelligence and take the necessary measures to prevent its potential negative consequences, which can neutralize all the positive effects of technological progress.
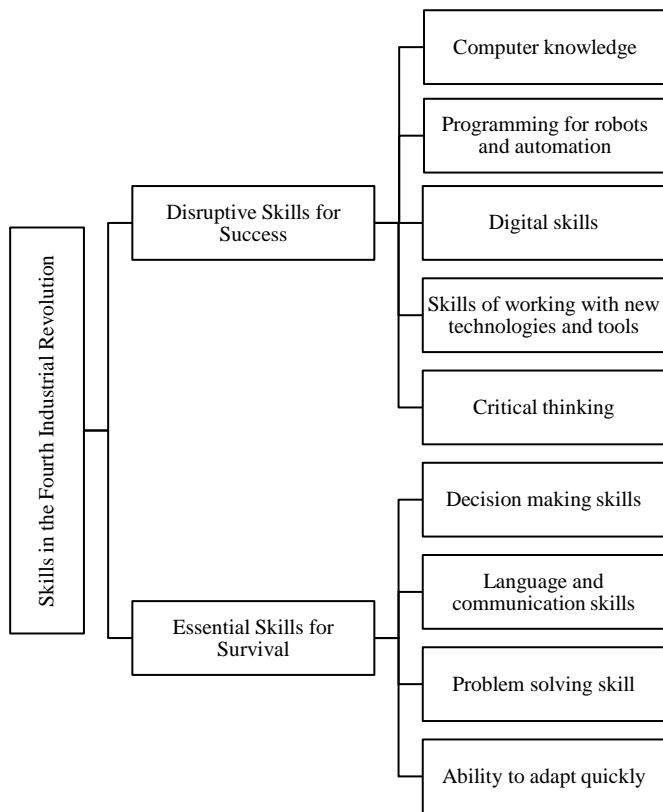

Fig. 6. Skills of the employees of the future required to work in the conditions of the Fourth Industrial Revolution

The global community needs to know and be able to recognize the risk factors posed by profound technological change and create an environment in which artificial intelligence will benefit all people.

VII. CONCLUSION

A new surge of interest in artificial intelligence is associated, first of all, with its inexhaustible potential as a tool for managing digital transformations in the economy. It should be understood that the transition to new digital technologies is inevitable and irreversible at the same time. And the speed and success of the digital economy will depend on how quickly the wareness of the need to integrate modern technologies, including artificial intelligence technologies, into management

and business processes will come. CEOs need to acknowledge this as a reality, change the format of work with a reasonable transition to new digital services, and develop the necessary competencies for staff to work with new technologies, the introduction of which is necessary for sustainable business development and the entire Russian economy.

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