

Digitalization of Economics and New Risks in the Leading Industries of FEC

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Abstract

This study is due to the need to accelerate the development of digitalization which will increase the competitiveness of corporations in the global energy markets. So far, the issues of digitalization of the economies of many countries, including Russia, are at the stage of accumulating of data and ensuring free access to them, which increases the possibilities of developing its areas, for example, digital power industry [1].

The choice of power industry as a priority object of digitalization in Russia is also due to the fact that in its GDP this industry occupies more than 20% [2]. Meanwhile, this must be done in the way that none of the sectors of the fuel and energy complex (FEC), as part of the system, would begin to dominate the others, eliminating the risks of its "collapse" as a single inter-industry complex of the country [3].

In other countries with a developed fuel and energy complex, the mining and manufacturing industries also lack the expected dynamics of the digital economy. Moreover, in some places there has even been a certain lag in the resolution of this issue, in comparison with the planned progress. Global energy companies, especially in the oil and gas sector, which are lagging behind in digitalization, may begin to lose competitiveness if they do not implement high-tech solutions that allow the fuel and energy sector to enter new markets for integrated systems and services of intellectual energy [4].

The purpose of this study is to develop a series of recommendations for the accelerated development of the digital economy in the fuel and energy sector, aimed at improving the competitiveness of global companies and increasing economic growth rates.

Keywords

Industry, Global Companies, Digitalization, Digital Economy, Competitiveness, Economic Growth, The Risks of the Digital Economy

Introduction

The active development of digitalization, due to the technological breakthrough of civilization to virtual technologies of doing business and using new communications opportunities in society, requires the solution of a number of emerging problems. Many of them are being solved successfully, especially in those countries that have become the source of digitalization ideas. However, they and other countries have not yet created a full-fledged digital economy that guarantees success as a result of the use of its inherent, new relations. Until now, problems such as the justification of conditions conducive to the construction of a digital economy management model for the fuel and energy sector have not been adequately addressed.

Based on the adoption and implementation of decisions in the context of big data, obtained in real time and accessible to all participants in the process.

It is unclear how much the use of this model of management accelerates relations between people, makes their work more productive, and management effective, reduces the cost of value added, improves the quality of the product and the competitiveness of companies. It has not yet been proved whether it is possible for the spatial development of the digital economy to create uniform principles for all participants and the standards for its construction. There is no clear answer to the question in which sectors the development of the digital economy should dominate and whether this will lead to a violation of the integrity and disruptions in the functioning of the entire economic system. Will the system support of such industries from the state be useful and how effective it will be? It is necessary to deal with the issues of protection against the risks of the digital economy, and personnel training in the conditions of total digitalization.

Solving these problems is an important task for both individual states and corporations, and for the world community as a whole.

Materials and Methods

The situational, structural and dynamic analysis was the leading method, which allowed to study the current conditions for the formation of the digital economy, changing in time, space, in close relationship with other

phenomena. A regulatory approach was used in assessing the state of the regulatory framework governing the operation of certain conditions for digitalization of the economy.

Research methods: expert assessments; regulatory method; situational, structural and dynamic analysis; economic modeling.

The practical significance of the research presented in the article is to develop recommendations for the development of the digital economy of the fuel and energy complex and their use in the activities of corporations, taking into account the risks involved.

Results

A number of recommendations were developed for the accelerated development of the digital economy in the fuel and energy sector, focused on improving the competitiveness of global companies and increasing economic growth rates.

The necessity of systemic support of energy as a priority direction of digitalization of the economy is argued, since it affects all sectors and spheres of life, has the necessary resources, intellectual potential and occupies a significant share in GDP.

To make decisions in favour of digitization of the fuel and energy complex, as the most important task of state importance requiring a systemic solution, it is also necessary to provide preferential loans or subsidies on terms favourable to producers of competitive goods and services.

It is the construction of relationships between people about the production and sale of its products based on the generated data, transmitted in large quantities at high speed, stored, protected and processed in special ways, on the basis of which better decisions are made to form new added cost or value.

The expediency of using the principle of responsibility in the formation of the digital economy is justified. Despite the implementation of digitalization ahead of global competitors, the decisions taken in the energy sector were as balanced and safe as possible - protected from various kinds of risks, precluding the likelihood of global negative consequences.

The creation and unification of common principles and standards for building a digital economy at various levels of government are recommended, taking into account harmonization with international approaches and requirements.

It is shown that in the fuel and energy sector digitalization is a tool for combining the virtual sector of the economy with the real in the process of their interaction.

It significantly speeds up commodity-money relations, the entire reproduction process, reduces labor costs and creates new opportunities for the development of businesses economic entities.

The need for the fuel and energy complex in highly qualified personnel with a worldview focused on protecting the interests of the state in the energy sector has been identified.

It is noted that when training personnel for the fuel and energy industries, the replacement of traditional methods and forms of knowledge transfer from the older generation to the younger-fashioned digital technologies can lead to a gradual “dehumanization” and the loss of human qualities that have been formed for thousands of years by the current generation.

The system risks of the digital economy are highlighted and recommended protection measures against their impact.

Discussion

The founder of the term “digital economy” is considered to be the American informatics Nicholas Negroponte (Massachusetts University), which, as is well known, in 1995 introduced the term [5]. Now the digital economy, in one way or another, is widespread throughout the world and is based on the digitization of all spheres of society. The digital economy has not yet brought revolutionary changes in the quality of life, but it does allow to create goods and provide services much faster, more qualitatively and with lower costs than it was before and is actively working on consumption.

Digitalization is a tool for combining the virtual sector of the economy with the real, in the process of their interaction. It digitizes money - an important resource of the economy, significantly speeding up their turnover and commodity-money relations in general, the entire reproduction process, reducing labor costs and creating new opportunities for economic entities.

Digital economy is a well-technologically equipped part of the economy, adequate to the current changes in the reproduction process, using the capabilities of the virtual space, the Internet, computers, information and communication technologies, artificial intelligence.

Consider the prospects for digitalization of the economy, adequate to the strategic targets of the fuel and energy complex, in particular, the oil and gas sector. The leading oil and gas companies “Rosneft” and “Gazprom Neft” not only announced their intention to develop digital technologies and the digital economy, but also set about implementing it, relying on certain prospects in the industry and inter-industry scale.

To implement the intentions in the system of the fuel and energy complex, among the main areas related to digitalization should be: the formation of the basic requirements for regulating the digital transformation of the energy sector on the part of the state, ensuring the flexibility and security of the implemented solutions; timely and balanced adjustment of the regulatory framework for digitalization; training of highly qualified, personnel, focused on protecting the interests of the state in the field of energy.

Regarding regulation, in accordance with world practice, the main driver for the development and use of international standards is business, combining its efforts with the state and promoting the digital transformation of the economy.

To meet the information needs of digital enterprises, real-time data interpretation is required. It is very important to timely obtain analytical materials created on the basis of interaction and complementarity of all systems with available information, as well as data aggregation and aggregation.

Under new conditions of network management, digital information in the form of specific data in an appropriate form becomes one of the key factors of the production process, and therefore a new asset, making it possible to form a new value or alternative value based on the monetization of the data provided.

Using the possibilities of digitalization “allows you to create a virtual clone of an object, its full digital copy, taking into account all the technological features and simulate the optimal mode of the production process for all phases of operation” [6].

Such opportunities make it possible to significantly increase the effectiveness of the operation of technological equipment, the safety of its operation, timely monitor the transition period of equipment to a critical state through appropriate forecasts and prevent malfunctions.

As a result of measures taken by public authorities creating conditions for the development of digitalization, more and more digitized objects appears in various sectors of the economy and in the fuel and energy complex.

The experience of their creation and operation is gradually taking shape, the technologies of operation are improved, the regulatory framework is being developed and the requirements for personnel adapting to the new working conditions are changing.

However, innovative modernization using digitalization capabilities is not effective for all objects. This statement, for example, refers to the modernization of enterprises that work well without digitalization, producing competitive products. Calculations show that often digitalization requires large financial investments in order to create an effective digital adoptions that, by increasing labor productivity and reducing labor intensity, will pay off no less than in 15 years.

To make decisions in favour of digitalization, as the most important task of national importance that requires a systemic solution, it is necessary to provide preferential loans or subsidies on terms favourable to producers of competitive goods and services in the domestic and global markets.

At the same time, there are many positive, cost-effective examples of the transfer of enterprises to work in the conditions of digitalization. In Moscow [7], for example, the first, exponential, digital power station, operating in an autonomous mode and serving the adjacent territories, was built. By all indicators, including in the first place, the level of automation, performance and energy saving, a significant reduction in energy costs. Online monitoring identifies problems that arise and allows them to be quickly resolved. The station is superior to world analogues, demonstrating the near future of energy.

The digital station is one of the key elements of the smart grid of the future. The next step is to bring the digital network to the consumer. Calculations show that the operation of the station and the digital network will improve the reliability of the energy supply of the population, reduce current costs by up to 30% and ensure return on investment, create prerequisites for stabilizing electricity prices for consumers.

However, along with the positive results, the digital economy also carries certain risks. So, integration into the global digitalization system, the use of foreign technologies, although adapted, but still (most of them belong to economically developed countries, develops new information and technological dependence on them and threatens the economic sovereignty of other states. This factor can be used as a political pressure on competitors. This can reduce political stability on a global scale and provoke conflicts.

As for Russia, according to experts, it can occupy only 2-3% of the global technology digitalization market [8]. To overcome this barrier, appropriate investments in this field of activity are needed.

In addition, projects for digitization of the economy are very costly and do not always pay for themselves quickly. Practice shows that not all economically prosperous business structures are in a hurry to digitize the economy because of the costs associated with its implementation and development.

Likewise, not all regions using digital technology show a big effect from digitalization. In these cases, there is a fear that digitalization projects may be implemented at the expense of consumers, through the inclusion of the cost of it in the price of consumer goods and services.

Also other risks arise. The digital economy is ultimately made for the sake of human development. By nature, man is a person, an individual, and a professional.

As for professional qualities, with the development of digitalization they can grow and improve. But not so well with his personal and individual qualities. Such a category as empathy (the criterion of personal development) and the notion of individuality are emasculated and may disappear, since a person becomes part of the “machine” and will eventually be replaced through robotization. Robots with artificial intelligence will do part of his work. In addition, the robot does not have morality and ethics, since it is a sensual substance that ceases to exist along with the emotions inherent in humans.

Counteracting these risks is possible within the framework of determining a reasonable ratio of technological and human.

It is also necessary to create conditions for the country to ensure a significant information leap - the development of its own, protected from external influence, information and communication technologies based on Russia's basic values and life principles that ensure the preservation and protection of its state sovereignty.

For digitalization, social risks, risks of the dominance of the technological structure over the moral and ethical state of society.

Without proper education and enlightenment, a person is not protected and not ready for the changes caused by the new industrial revolution and its digitalization. Unfortunately, they occur much faster than a person can adapt to them without losing the value orientations, moral, cultural and spiritual foundations of their existence.

The statement of the problem must be such that it is not man for the sake of the industrial revolution, the development of digitalization and economic growth, but on the contrary, digitalization and economics for the sake of man, his preservation and development within the framework of the values of traditional cultures and beliefs of a multi-ethnic people.

Moreover, in the field of education there should not be total digitalization. The departure from the traditional forms of relations in education is total replace them with digital technologies rather ambiguously affect people [9].

It is not enough for the student to hear only the teacher's speech, he must see his facial expressions and articulation, feel the energy of thought, activating the work of neurons. He should be able to ask questions and get live answers, seeing the teacher's face, join the discussion, and include emotional intelligence. Even the teacher's personal charm, his manner of communication, establishing contact with the audience, presenting the material, the look and smell of the perfume, are finely tuned to the wave of perception of knowledge that the audience is sitting in front of him.

Live communication with the teacher should dominate in comparison with virtual learning.

Education is in many ways a process of exchange of cultures between the teacher and the students, during which an image of the students is formed. An important role is played by education, carried out through live contacts with people, which cannot be replaced by digital technologies.

Replacing traditional methods and forms of transferring knowledge from the older generation to the younger, with modern digital technologies, will inevitably lead to a gradual "dehumanization", to the loss by the modern generation of independent thinking skills and many other human qualities that have been formed for thousands of years. According to Kulebyakina, E.N. as a result of this, the new generation can become just a part of the matrix, controlled by the force controlling digital and information flows, threatening the sovereignty of the country, and to each person individually.

The digitization of the fuel and energy complex requires an increase in the number of electronic applications, and consequently, of qualified specialists capable of developing them at a high quality level. It will take years to train such specialists if you don't buy them all over the world. Even having received the necessary number of people capable of creating digitalization products that are competitive with the best world analogues, it is necessary to work hard on how to keep them. In addition to providing interesting work, they need to pay a competitive salary and create living conditions, no worse than in other economically developed countries.

It is advisable for the state and corporations of the fuel and energy complex to put in their respective development programs protection measures against possible personnel risks.

There are also risks such as: avalanche loss of jobs due to robotization in traditional sectors of the economy; risks of losing data and even business; technological risks of various failures.

In order to avoid the listed risks, it is necessary to change the legislation in general and in the field of digital technologies; labor market regulation; the formation of new requests for the preparation of high-quality specialists.

Conclusion

Experts and managers of fuel and energy companies understand that without a digital economy, the use of digital technologies cannot compete successfully in the domestic and foreign markets. The implementation of programs for the digitization of the fuel and energy complex is going well. However, to speed up the process of creating a digital economy and improve its quality parameters, effective solutions must be found in the field of staffing, state support and government regulation, unification of common principles and standards of digitalization.

The practical significance of the study lies in the use of article materials in the activities of organizations of the fuel and energy complex in developing and using recommendations for the development of the digital economy. The materials of this article may be useful in the educational process of educational institutions.

Conflict of Interests

The author confirms that the submitted materials do not contain a conflict of interest.

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