Assessment of the readiness of industrial production for digitalization in the Russian Federation

K A Artamonova¹, O Yu Gavel¹, D S Lopatkin², L E Kopylova², O M Aliev³ and A A Gibadullin⁴

¹ Financial University under the Government of the Russian Federation, 49, Leningradsky avenue, Moscow, 125993, Russian Federation
² Mendeleev University of Chemical Technology of Russia, 9, Miusskaya sq., Moscow, 125047, Russian Federation
³ The Tajik state university of finance and economics, 64/14, Nahimova Street, Dushanbe, 734055, The Republic of Tajikistan
⁴ State University of Management, 99, Ryazan Avenue, Moscow, 109542, Russian Federation

E-mail: 11117899@mail.ru

Abstract. The paper considers the assessment of the readiness of Russian production for digitalization processes. The study analyzed the main trends in digitalization in the Russian Federation, the level of available resources for the transition to digital technology. Based on the results of the study, measures were proposed to increase the efficiency of the transition to digital technologies in the Russian industrial sector.

1. Introduction

The industrial production of Russia was finally formed in the last century, when the following types of economic activities were fully established - this is mining, manufacturing, production of electric energy, gas and steam, air conditioning, water supply and waste management [1-3]. Industrial production cannot be imagined without interconnection with scientific and research institutes that create new models of equipment and technology. Scientific and technical development is the basis for the development of any state, since within the framework of this activity, new equipment is developed and introduced, the production process is facilitated, production costs are reduced, and the transition to automated, mechanized and digital technologies is carried out [4].

Today, the main trend that exists in all economies of the world is the need to switch to digital technology [5-6]. In Russia, this trend also takes place, for example, legislative acts, Decrees of the Government of the Russian Federation, Decrees of the President of the Russian Federation and other industry acts aimed at the introduction and use of digital technologies at the corporate and state level have been adopted at the federal level. The effects of the introduction of digital technologies in the private sector will be expressed in increasing the competitiveness of products and enterprises, creating new models of functioning and business management, improving the quality of services and systematizing all production processes. In the public sector, they will increase the efficiency of planning, management and development of territories, fulfillment of state functions and maintaining a socially stable situation in the country [7-9].
In the opinion of the authors of the study, the issues of transition to digital technologies require not only decision-making at the state or corporate levels and determination of the effects of digitalization, but also an assessment of the possibility and readiness of the national economy, industrial production and enterprises for digitalization processes [10-11]. In this regard, the authors consider it necessary to assess the readiness for digitalization of industrial production.

2. Materials and methods

The aim of the study is to assess the readiness of industrial production for digitalization processes. To achieve this goal, the following tasks:

- analyze the level of implementation of information and communication technologies in industrial production;
- assess the readiness of industrial production for digitalization processes.

In the framework of the work, methods of factor, statistical, logical, comparative and system analysis were used, which allowed the authors of the study to solve the tasks.

3. Results

In 2019, the State Atomic Energy Corporation Rosatom released a report on the national digital economy index, in which it compared the level of digitalization in Russia and the countries of the world. Because of the assessment, it was revealed that Russia ranks 23rd out of 32 countries surveyed by the digital economy development index, it is worth noting that approximately all kinds of economic activities of the national economy are in this position. It was revealed that the impact of digital transformation is to increase competitiveness and ensure growth, Russia in this ranking takes 40th place out of 46 countries surveyed [12-14].

The analyzed national rating showed that Russia is not a leader in terms of digitalization and the effects of digitalization, in this regard, we will analyze indicators that reflect the readiness of industrial production for digitalization in Russia. Consider the use of information and communication technologies (figure 1) [12-14].

![Figure 1](image-url)

**Figure 1.** The use of information and communication technologies in industrial production, as a percentage.

The figure shows that in industrial production the volume of use of information and communication technologies is over 90%, the level of use of electronic document management in organizations is
about 60-65%, and the level of use of the Internet for communication with suppliers and consumers is on average 70%.

Thus, we can conclude that the level of use of information and communication technologies is at a fairly high level, however, the digitalization indicator is associated not only with the use of the Internet or electronic document management, but also with the digital processes for obtaining raw materials, their transfer, conversion to the final product and its transfer to end consumers [15-17]. However, in order to switch to digital technologies, appropriate specialists are needed to ensure a high-quality transition to digital. Consider the number of information and communication technology specialists involved in the digitalization of industrial production (figure 2) [12-14].

![Figure 2. Specialists in information and communication technologies in industrial production in 2018 (people; per 10 thousand employees of organizations).](image)

The figure shows that the largest number of specialists in information and communication technologies is observed in the electric power industry and amounts to 145 people per 10 thousand employees, and the smallest - in mining. We can conclude that in industrial production in the digital environment only 1% of employees are employed, which, of course, is not a driver for the transition to digital technologies.

Next, we consider the need of the national economy for specialists in digitalization (figure 3) [12-14].

![Figure 3. The most sought-after digitalization experts.](image)
We see that the national economy is experiencing a shortage of specialists in almost all types of activities. More than half of the managers surveyed noted a lack of personnel in the field of digitalization, at the same time, companies are trying to increase the competence of personnel in the field of information and communication technologies, although this is not always an effective way to transform into a digital environment.

Thus, the analysis shows that the introduction of digital technologies in the national economy is gradual, but today the economy does not get any significant results, and in comparison with other countries of the world, the digitalization result in Russia is minimal. Russia's industrial production is gradually shifting to digital technologies, and the level of introduction of numbers in industry is quite high, however, there is an acute shortage of relevant specialists in the field of information and communication technologies [18-19].

4. Discussion
For the most effective transition to digital technology, a number of measures are required that will ensure the qualitative and quantitative transition of industrial production to digital. In our opinion, these measures should be based on the following [20-22]:

- adoption of a package of legal acts related to the proportional implementation of digital technologies in industrial production;
- develop government support measures for the transition to digital technology;
- form new educational programs aimed at increasing specialized specialists in the field of information and communication technologies;
- create special programs and courses to improve the skills of specialists in the field of digital technology development in industrial production;
- ensure the development of R&D at the state and corporate level;
- provide the necessary amount of labor and material resources;
- creation of the necessary infrastructure;
- ensuring the accessibility of the created technologies for state and corporate structures;
- reducing cyber security.

Thus, in order to implement a qualitative and quantitative transition to digital technology, the implementation of the above measures is required. At the same time, these measures cannot be carried out without the collaboration of state and private structures in order to achieve the tasks set at the national level.

5. Conclusion
The study revealed that the transition to digital technology is a modern trend and requires the national economy to follow these trends in order to increase production efficiency. It was found in the work that today Russia takes 23rd place out of 32 analyzed countries in terms of the digitalization of the economy, and in terms of efficiency in terms of digitalization in 40th place out of 46 states surveyed. The study also analyzed the industrial potential in terms of digitalization, because of which it was revealed that the use of various information and communication technologies is at a high level, while the number of specialists involved in the digitalization process is minimal. The study found that the national economy lacks personnel for digital transformation. At the end of the study, measures were proposed that would ensure the qualitative and quantitative transition of industrial production to the digital path of development.

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