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DIGITAL INDUSTRIALIZATION AND TRANSFORMATION OF THE REGION'S RESOURCE-BASED ECONOMY

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Abstract

The article is imitated to the study of urgent problems of the Russian economy; the study of the possibilities of digital technologies; the study of the possibilities of developing strategies for the technological development of regions in the conditions of Industry 4.0. The paper reveals the experience of digitization, emphasizes the use of the resource potential of the region in view of stratification in technological development of the Russian Federation. The analysis of strategies for digital transformation of the economy of Russia, Germany, Japan, China, the United States. The methodological basis of this work involves basic research of Russian and foreign scientists in the field of scientific and technological development, strategic management and regional economy. In preparing the article used the following methods of research: methods of system and formal logic, scientific analysis and synthesis, comparative analysis of economic and statistical methods and others. The characteristics of the processes of digitalization of the economy at the regional level are formulated. Analyzed the statistical data on the use of information technologies in the Russian Federation. The advantage of the work is an integrated approach and the consideration process of digitalization of regional economies, innovation processes at the business level, the possibility of the effective use of the resource potential of the region, taking into account different socio-economic effects. Disclose factors that determine the effectiveness and efficiency of the process of economic development of resource type region under the Industry 4.0.

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Keywords: Economy's digital industrialization, resource type economy.

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1. Introduction

The modern economic formation is characterized by many researchers as a digital economy based on the use of digital technology and digital innovation. Industrialization is also relevant in solving the problem of significant regional and inter-regional differentiation, improving the quality of life of the population of territories, including regions with economies, which are mainly oriented towards raw materials production; It is called upon to activate the existing potential for industrial growth and development in a number of traditionally priority sectors for Russia and Siberia. The main goal of reindustrialization process should be to restore the role and place of industry in the country's economy as its basic component, its diversified growth through the development of high-tech industries.

According to Academician Yevgeny Primakov:

> *The main features of the new industrialization: - diversification of the economic structure in the direction of increasing its share in the manufacturing industry; providing this process with labor resources of appropriate qualifications; modernization of the country's financial system to the needs of reindustrialization; development of the "channels", "lift" linking scientific potential with the production industry; systemic import of high technologies.* (Bodrunov, 2012, p. 30)

Digitalization and globalization of the world economic space and the intensification of Russia in it - has increased differentiation and specialization of the raw materials, the dependence of the Russian economy from the natural and political development of the factors for the period from 1997 to 2011 the export of oil and gas in the country's trade balance has increased to almost 70%.

The trend in foreign trade, determined by the prevalence of the primary sector of the economy, remains. After 2015, the share of certain types of high value added products in the structure of Russian exports increased, but the share of fuel and energy products decreased.

In 2019, mineral products and fuel and energy products prevailed in the export structure. The economic development of the country is also built on the dominance of the raw material industries. It is highly dependent on the available natural reserves and the dynamics of foreign trade prices in the quintessence with geopolitical factors of influence. The raw material factor, which is often interpreted as a “resource curse” for the Russian economy (The Federal Law, 2014), continues to have an impact on the country's economic development. The nature of the impact of commodity specialization and possible effects should be determined. It is important to find qualitatively new factors of innovative development of the regions with raw material orientation new methodological basis of management digitalization of the economy with raw materials specialization of regions.

2. Problem Statement

The article is devoted to the problem of industrialization in the conditions of Industry 4.0 of special regions with a resource-type economy. There is a need to determine both industry priorities and the needs of these regions in digital technologies.

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3. Research Questions

The object of the research in the article is the processes of reindustrialization in the conditions of Industry 4.0, the features of the implementation of these processes in regions with a raw material economy. The traditional sectors of the economy of regions are spoil and processing resources, which can be seen in the structure of gross regional product (GRP).

4. Purpose of the Study

The purpose of this study is to determine the characteristics of digitalization of Russian regions with a resource-based economy, to study the technological development strategy in the context of Industry 4.0 in a number of industrialized countries in the context of determining priorities and theoretical approaches to digital industrialization.

5. Research Methods

The methodological basis of this work includes fundamental research by Russian and foreign scientists in the field of scientific and technological development, strategic management, and regional economics.

5.1. The regional level of industrialization and the formation of the digital environment

The information space is considered as an integral part of the human environment now. Its features are the multifactorial impact on society and single person. So, the information itself has an influence on social development and the spiritual sphere, and the means of its distribution for technical and software, directly affect the physical and mental state of a person. The main problem of the information society is information inequality, i.e., the differentiation of users by the level of access to information. The role of the new institutional basis for increasing the investment attractiveness of innovative activities and the involvement of the entrepreneurial sector of the economy is growing. The industrialization of the Soviet Union that took place in the thirties of the last century, was also due to the transition to a new technological order, which allowed, formed the productive forces of the world economy according to new requirements. The old system of productive forces linked to the country's industrialization objectives.

Noteworthy are other examples of reindustrialization, and factors that determine economic growth. Post-war reform of the Japanese economy (1950-1960) and the phenomenon of “Japanese miracle”, when the country achieved significant success in the field of advanced training of the workforce, the development of creative abilities of managers, which allowed it to easily introduce and apply modern foreign technological achievements everywhere and, as shown by the example of the electronics industry, on this basis to put into practice their improvements. In the next five years, all this led to a steady increase in labor productivity; Japan once a year increased labor productivity by 9.9% (Auty, 1993).

Now, Russia has go on board a path that Japan has already traveled to 2000. In terms of determining the direction of development of the "information society", preparing and adopting the necessary information legislation, optimizing public administration using information communication networks and the Internet (the "Electronic Government" program), providing a legal mechanism for citizens to access information

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and protecting citizens' personal information, the transition to high-definition television broadcasting, providing third generation mobile communications. To date, up to 2035 identified 130 innovative trends, critical technologies that affect the competitiveness of the economy and solving social and economic problems in Japan. The priority directions of scientific and technological development of the Russian economy 30 technology platforms approved by the decision of the Government Commission on High Technology and Innovation (Bodrunov, 2012). We should also mention the experience of industrial development, the modernization of the Korean economy, Singapore, the Chinese model of the 1980s and 1990s. The main task of China's economic reform during this period was to ensure long-term sustainable economic growth based on the creation of new private enterprises and the involvement of the economically active population by refraining from total domination of state ownership, attracting foreign investors in the Chinese market. Table 1 presents the features of the new industrialization (Bodrunov, 2012).

Table 01. Features of the new reindustrialization, taking into account the regional aspect

Features of the new reindustrialization	Regional aspect
Avoiding “technological gigantism”, minimizing the number of basic technologies.	Coverage of the most advanced production technologies, combined with a flexible approach to the selection of directions for the development of regional industry.
Rationalization selection and concentration of production technologies.	Formation of centers of competence of advanced regional development.
Enhancing the role of integrated industrial structures.	The formation of high-tech cluster structures taking into account the specifics of the region, a network model of interaction.
Refusal to preserve outdated technologies and preserving the technological gap.	The development of technologies of a new level, taking into account regional specifics, raw materials.
Big purchase of the most advanced technologies.	A selective approach in determining the technological directions of development of the region, taking into account the achievements of scientific and technological progress.
Reconstructing the “production of machine tools for the production of machine tools” - domestic machine tool building and other blocks of “production of the production sphere”	Taking into account the interconnectedness of technology and the economy of the region. Possibilities of intersectoral and interregional cooperation.
Changing approaches to capacity reservation.	The concept of technological development leadership in high technology sectors of the region’s economy.
Enhancing the role of institutions of scientific and technological development in the creation of new industrial base.	Improving the innovation infrastructure of the region.
Improving the investment climate in the industry.	Development of institutions and investment support tools.

Identifying key factors of re-industrialization, economic growth and differentiation in the existing models of the last two decades, various countries should indicate the technological core of the fifth technological structure, the development of communication links and technology, the information revolution, the emergence of the knowledge sector reproduction.

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5.2. Digitalization in the business environment and the level of regional differentiation

The regional aspect is becoming more relevant, the role of regional clusters and innovation systems as points of economic growth and innovative development of the economy is growing. In this context, the question arises, and the objective necessity of territorial differentiation, identification of areas that may be the key areas that have the highest potential for development, the cumulative effectiveness of territorial cooperation, stimulate regional development and reducing the level of economic disparities. The influence of technology can be review as a disorganization of existing economic processes, systems and sectors, organizations, changes in the current consumption model of a modern consumer, business models. In some industries, it is possible to observe the impact of technology, which is already manifested in the dominance of a new type of company: Uber (the world's largest taxi operator), Facebook (the world's most popular media company), Alibaba (the world's largest Internet retailer with the highest estimated cost).

The submission process of digitization in the business environment level led to the need for the separation of the life cycle of innovative companies on stage. In accordance with the most common approach, the following stages are distinguished: sowing, start-up, early growth, extension and later on. At a late stage of development of the company, the investor exits, i.e., completes his investment cycle. In some approaches separately from sowing recovered pre-sowing step. International experience shows that it is small innovative enterprises, including those created at research institutes and universities, that become a necessary element of the digital economy. Together with new technologies in the company come in and new people unit, which is responsible for developing and implementing the strategy of digital transformation, the formation of the corporate center of competence in the field of digital technologies and to provide leadership in change management associated with the introduction of through digital technologies in all activities. Technologies of Industry 4.0 used by business: cloud technologies, multi-level interaction with a client, personification of a client profile, the Internet of Things technology, 3D printing, smart sensors, analysis of a large data array (Big data) and complex algorithms, advanced human-computer interaction interfaces, personal devices of additional reality.

At the level of business and organizational development, in order to implement the digital transformation strategy and use the potential of digital technologies to increase business efficiency, it is necessary to determine the stage of development and the scope of activities in which digital technologies are necessary: marketing, sales, management accounting systems, production, automation of operations or combination all stages and functions. In the second step should be to identify priority technology as in the use of digital technologies are always too many tasks, and determine the factors and possible resistance to organizational changes in the conditions of Industry 4.0.

One of the most important areas of digital technology application are CRM-systems. Customer Relationship Management - customer relationship management is a modern business management model aimed at creating long-term mutually useful relationships with customers through understanding their individual needs, creating a high consumer value proposition; a set of tools for working with the client base, with information, a methodological framework that allows you to generate and organize data, manage customer data.

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5.3. Regions with a raw-type economy and features of digital reindustrialization

The digital economy has significant potential for developing countries for which such economic shifts can mean economic growth. On the regions represented by illustrations of raw specialization of the economy is leading the Sakhalin region, Tyumen region, Orenburg region - almost 50% more in the GRP structure occupy the extractive industries. According to the criteria for classifying a region as "raw", different methods are used. For example, the share of mining in the structure of GRP, the ratio of gross value added of mining and manufacturing in the constituent entities of the Russian Federation. The most commonly used share of gross value added from mining in the GRP structure (Tapscott, 1996). Interesting are the facts of Federal Service of State Statistics illustrate the direct use of digital technologies number of federal districts and subjects of the Russian Federation, presented in Figures 1, 2 and 3.

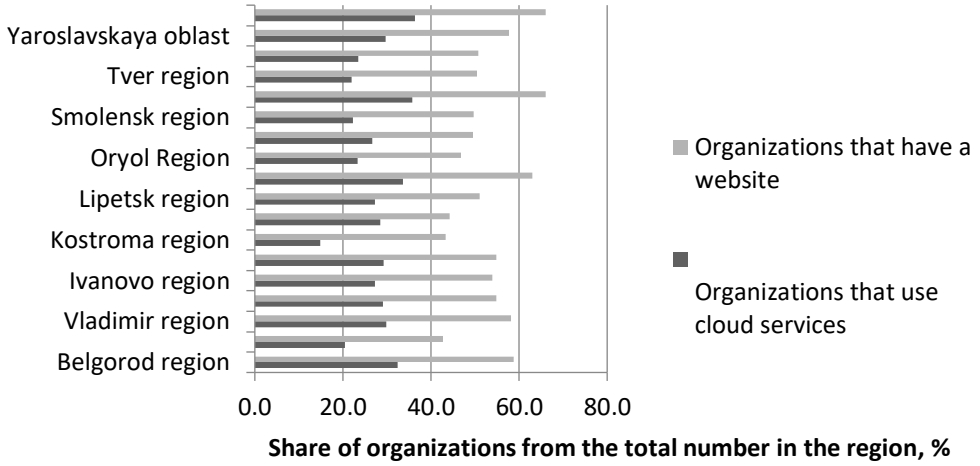

Figure 01. Use of information technologies in the Russian Federation in the Central Federal District

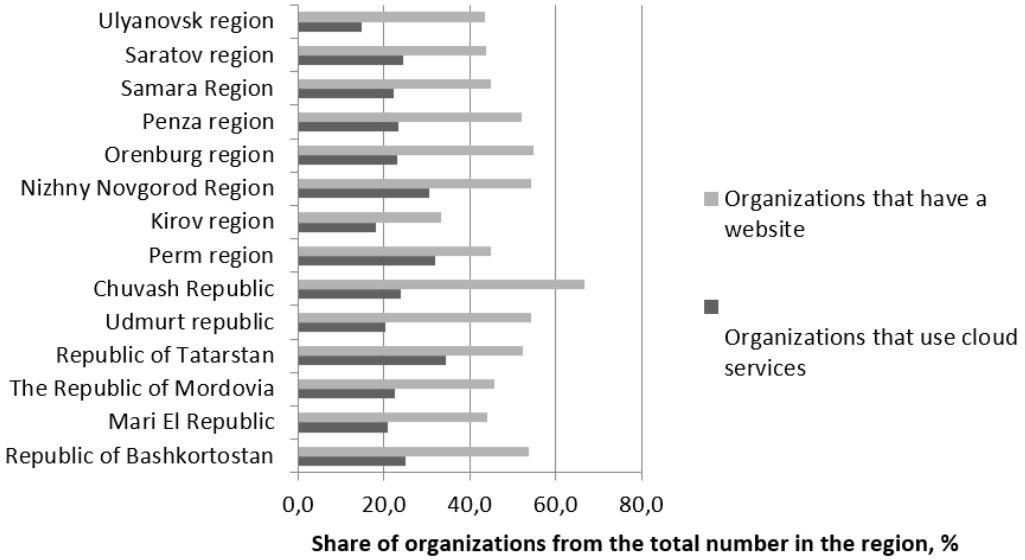

Figure 02. The use of information technology in the constituent entities of the Russian Federation in the Volga Federal District

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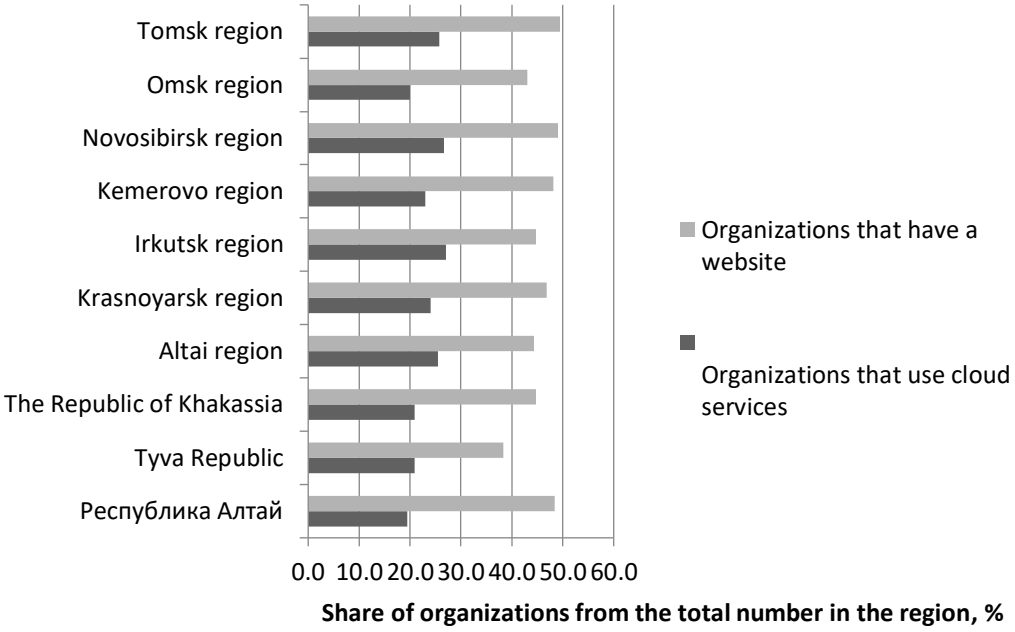

Figure 03. The use of information technology in the constituent entities of the Russian Federation in the Siberian Federal District

Considering the position of the regions in the ratings of innovative development and the ratings of regions in terms of the level of development of the information society, it should be noted that there is no relationship between the prevalence of certain commodity sectors of industry in the structure of the gross regional product and the position of the region in the ratings. For example, the Republic of Tatarstan, which has a significant share (20.5%) of extractive industries in the structure of GRP. Tatarstan rose from the 6th place in 2010 to the 2nd place in the ranking of 2013, and according to the latest data - in 2015 it was ahead of Moscow and the Moscow region and headed the rating of innovative development of the constituent entities of the Russian Federation.

In the Central Federal District, in terms of the distribution of information technology in business (website availability, use of cloud services), the average distribution level, respectively, in terms of indicators, reaches from 30 to 60% of the total number of organizations in the region. In the Volga Federal District, which includes regions with innovative leaders, in terms of the use of cloud technologies they also reach 30-35%, and in the number of organizations with a website - more than 65%, in the Siberian Federal District these indicators are lower - 25 and 50%, respectively.

5.4. Digital industrialization in different countries

The term "digital economy" refers exclusively to the now taking place and still incomplete transformation of all sectors of the economy due to the digitalization of information using computer technology. Researchers Brynjolfsson and Kahin (2000) sought to demonstrate that there is something that goes beyond the previous concepts. Research processes digital platformizatsii in the works of Kling and Lamb (2000), Negroponte (1996) show that in each country, which demonstrates progress in the development of the digital economy has its own strategy and priorities of industrialization through the use

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of digital technology, the experience, and the absolute leader in the development of all aspects of it does not exist.

Table 2 shows the differences between the strategies of digitization in some countries - the leaders and Russia, in which you can note stratification in technological development.

Table 02. The difference digitization strategies in different countries

Country	Russia	Japan	Germany	China	USA
The name of the strategy	Digital Economy of the Russian Federation	Society 5.0	Industrie 4.0 (Cyber Physical Systems - CPS)	«Made in China 2025»	Industrial Internet Consortium
The main goal of digital development	Scientific and technological development of Russia.	Technological development and motivation of the large companies in the creation of a socially-oriented technologies.	German leadership in the industrial sector.	Cross the gap with Western achievements in high technology and decrease China's dependence on imported technologies.	Improving technology, sharing best practices and achieving best results through strategic alliances.

Germany is a pioneer of industrial technology. Here, about 10% of the population is employed in high-tech industries, which is about two times more than in Russia. After the global financial crisis of 2008-2009 in Germany there is a tendency towards reindustrialization. The new approach involves increasing the competitiveness of products by integrating “cyber-physical systems” into factory processes by connecting machines, machine tools, storage facilities to the “Internet of things and services”. Implementation of such systems and customized manufacture identified as the most important part, of the coming of the "fourth industrial revolution". This is a qualitatively new interaction of intelligent equipment and means of production. According to some estimates, German business is ready to invest about 40 billion euros annually in industrial Internet infrastructure by 2020 (Gronauer, 2014).

China has "digitalized" the multimillion population. The Chinese today are actively using Internet retail, the capabilities of online ecosystems and digital banking. The rapid transition of consumers to the electronic trading format here is due to the fact that online commerce has developed here partly to replace the development of physical retail formats, and the low level of development of financial institutions and banking infrastructure contributed to the rapid spread of financial online services. "Made in China -2025" - the People's Republic of China development plan, is based on the principles of development of China's manufacturing industry for the coming decade.

The transition to a modern digital technology platform is a strategically important decision. The Digital Economy program in Russia is aimed at developing specific technologies for the formation of a new country's economy. The main efforts are supposed to focus on “cross-cutting digital technologies” and “creating an ecosystem of the digital economy of the Russian Federation” (Ivanov, 2017, p. 6).

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6. Findings

The role and characteristics of digital industrialization in the technological development of regions with economic raw-type. The factors determining the effectiveness and efficiency of the technological development of the economy of a region of a raw-type are disclosed. Formulated the characteristics of the processes of digitalization of the economy at the regional level, analyzed the statistical data on the use of information technologies in the Russian Federation. The analysis of digital transformation strategies of the economies of Russia, Germany, Japan, China, the USA is presented.

7. Conclusion

Digitalization of the region's economy will certainly influence its specialization, including the region's raw materials orientation of the economy. Digital Transformation and selection of priority directions of development for the region to become its core competence, which determines the maximum efficiency of the use of natural raw materials factors development of the region and adherence to the required harmonic branch structure, which is complemented by attendant providing industries and activities (Gronauer, 2014; Sumina, 2015, 2009; Tsuru 1981). Therefore, the raw material specialization of the region’s economy is not the dominant factor in the negative impact on the level of innovative development of the region.

Based on the foregoing and the presented analysis, it is possible to draw the following conclusions: raw material specialization is not a “curse” and not the primary basis for reducing the effectiveness of innovative and information processes in the regional economy; it is necessary to create regional mechanisms for identifying and implementing a strategy for the development of the digital environment in regions with a raw material economy, the formation of sectoral and scientific and technological priorities for the digital development of the region’s economy, which can also be related to resource based on natural factors, industries, but excluding the dependence on mono-industrial policy of the region; mechanisms are needed to engage the business sector in innovative processes of digital transformation in the regional economy. The digital environment provides the necessary technological basis for the use of the resource advantages of the region.

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