
THE PECULIARITIES OF TERRITORIES' SPATIAL DEVELOPMENT UNDER THE CONDITIONS THE NEW INDUSTRIAL REVOLUTION

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Purpose: the study aims to work out a complex of measures oriented on regions' adjustment to the modern industry's new circumstances and the implementation of technological innovations under the conditions of the coming Industrial Revolution. *Discussion:* the research is based on the general scientific methodology that presumes systemic approach towards the defined problem-solving. Methods of empirical investigation (examination, comparison, data collection and investigation) are implemented together with current and perspective analysis, the synthesis of theory and practice are used. *Results:* the holistic system made up of different elements of social environment and high-tech production that tends to self-development and quick adjustment to new circumstances is to become the core of territories' spatial development in the context of advanced industrial transformations. To guarantee the country's economic development by means of new technologies and industries it is vital to overcome «digital gap» via favorable climate creating that enables the investment increase in digital technologies. Besides, it is necessary to modify laws regulating companies' competition, their staff competence in line with the new economy demands which can stimulate the entrepreneurial inflow in the existing fields of activities. A special emphasis is to be made on the leading regions that by means of their resource potential are capable to ensure the qualitative breakthrough in the sphere of high technologies and create a solid basis for production modernization and the country's innovation development on the whole.

Keywords: Industry 4.0, the Fourth Industrial Revolution, spatial development, regions, resource potential, social changes.

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Introduction

The recent changes of Russia's social and economic space are primarily connected with rapidly changing development directions in the sphere of technological innovations and innovative transformations that are set by the world's developing countries. The concept of the Fourth Industrial Revolution «Industry 4.0.» presented in «Hannover Messe 2011» [5, 6, 16] gave a new direction of innovation transformations in an industrial sector that became a starting point of the innovation race of economic «arms» in the world's developed countries. The mass implementation of cyber-physical systems into the production process and human needs satisfying with the subsequent increase in productivity and generated added value are key target indicators of Industry 4.0. In this context France, the UK, Italy, Belgium, the Netherlands, Russia and other countries implemented these programs which are aimed at the structural transformation of their territories' industrial sector by combining digital, physical and biological systems into new highly technological industries [8, 16].

However, some Russian and foreign experts are of the opinion that the direction set to modernize and innovate modern economies technologically has its both positive and negative consequences [10, 13, 17, 18]. So, in other words, the full development of NBIC-convergence [18, p. 77] is impossible to achieve without the appropriate infrastructure level and human capital on the whole.

According to analysts' forecast [1, 15, 19] within next 30 years about 30% – 50% of workforce will be replaced by robots in all economic sectors: from agriculture to hotel business. It is highly likely that some professions will disappear – those that are connected with administration, financial accounting and bookkeeping. Drivers, bakers, insurance agents, realtors, sellers, collectors, pharmacists and some others whose professional functions can be automated or replaced by computer programs are also likely to lose their jobs [2, 7]. It will have a great impact on the nature and structure of production processes, communications, social structures and the socio-economic transformations of the country.

In this context it is critically important to consider further changes of the territories' social and economic development due to their resource potential. The territories' development will depend on the implementation of new technologies and products of industrial modernization into the life of society.

Main ideas

Nowadays it is generally recognized, that originally social and economic space has its diversified nature and organizationally complex structure making a great impact on human life's conditions. [12, p. 44]. First of all the spatial development implies the settle system, the infrastructure maintaining system, the system of production and natural resources management. All these are closely dependent and under the impact of certain factors can aggregate their cumulative potential in creating the specificity of the regional production structure and its life-support system of the population. In this regard the analysis and

monitoring of spatial development contributes to a better understanding of different territories' transformations. This analysis also enables to explore new opportunities for the territories' social and economic differentiation and to work out adaptation measures.

On the basis of research results on Russia's spatial development monitoring [3, 4, 11] we think that positive dynamics of the region's territorial development is conditioned by some mechanisms of spatial development such as: agglomerative effect, the detachment of periphery resources, the center's innovations expansion to periphery that leads to the uneven development and centralization of economic activity in cities rather than in rural areas.

Consequently, while setting the tasks of national industry's recovery and regions' technological modernization it is necessary to take into account the uneven development of territories and its negative outcomes. Nevertheless for Russia, a country that is characterized by its uneven economic development, such disparity is a crucial factor for institutional modernizing and projecting of new technological approaches projecting on the regional level.

Nowadays the idea of technological breakthrough that fosters the country regional economic growth and guarantees their leading positions in the production of technologically advanced products has promoted the implementation of new state programs, the establishment of commercial and non-commercial associations that are focused on the development of technological innovations and the production digitalization. The key document that regulates the transition to the new stage of industrialization in Russia is the 2014 Federal Law «About new industrial policy of the Russian Federation».

According to Russia's industrial policy regional authorities are adopting legal and regulatory basis that is to define some issues of technological modernization and innovative development of regional industry aimed at the legal regulation of relations between industrial entities and local authorities.

For a better understanding of transformation processes taking place in regional territories' spatial development in the context of Industrial Revolution it is vital to analyze regions' resource potential as a means of production modernization and technological innovations' implementation.

Based on the Federal State Statistics Service data, the production of high tech materials for nanoindustry in Russia has risen from 303,3 tons in 2016 to 341,4 tons in 2017. The proportion of organizations dealing with technological innovations is dynamically increasing. Although the number of such organizations is not solid yet but still it has gradually increased from 7,3% in 2016 to 7,5% in 2017. The highest number of organizations implementing technological innovations is in the tobacco industry – 47,1%, computers, electronic and optical equipment – 31,9%, medicines and medical materials – 31,6%, electrical equipment – 24,5%. The less technologically advanced spheres are seen in agricultural production and post-harvest processing of agricultural products – 2,1%, publishing activity – 1,8%, advertising – 1,6%, construction – 0,7%, scientific activity – 0,6%.

It is encouraging to note the growth of production industries using advanced technologies in Russia. In 2017 the number of such industries was equal to 240.0 thousand units that is higher by 3,3% in comparison with the previous period. Manufacturing shows the highest level of advanced technologies implementing – 157.9 thousand units, including the production of computers, electronic and optical issues – 24.2 thousand units; scientific research – 23.6 thousand units, and the production of cars and equipment – 14.2 thousand units.

Table 1 indicates that most regions of the Central Federal District (CFD) are characterized by accelerating their innovation and industrial potential that is seen in the growth of organizations carrying out researches, in the increase of domestic spending on research and the implementation of advanced production technologies.

Table 1

The innovation activity indices of the CFD regions¹

| Regions | Proportion of organizations carrying out researches, units | | Domestic spending on research, mln. rub | | Number of advanced production technologies, units | |
|------------------------|--|------|---|-----------|---|--------|
| | 2013 | 2017 | 2013 | 2017 | 2013 | 2017 |
| Belgorodskaya | 15 | 19 | 1465,6 | 1921,0 | 1421 | 2408 |
| Bryanskaya | 21 | 20 | 352,1 | 977,7 | 1225 | 1603 |
| Vladimirskaya | 22 | 29 | 3647,8 | 5391,3 | 3310 | 6728 |
| Voronezhskaya | 56 | 65 | 6172,2 | 8164,5 | 1897 | 2538 |
| Ivanovskaya | 19 | 23 | 572,0 | 585,7 | 744 | 933 |
| Kaluzhskaya | 41 | 43 | 9316,5 | 6070,9 | 2057 | 3176 |
| Kostromskaya | 7 | 8 | 101,8 | 130,8 | 1541 | 1668 |
| Kurskaya | 16 | 16 | 3013,6 | 5936,1 | 1314 | 1291 |
| Lipetskaya | 12 | 21 | 233,0 | 291,1 | 3653 | 3422 |
| Moskovskaya | 235 | 251 | 93252,4 | 119715,9 | 14458 | 16819 |
| Orlovskaya | 14 | 18 | 474,5 | 976,4 | 1479 | 1498 |
| Ryazanskaya | 19 | 25 | 1400,7 | 1594,4 | 1362 | 1603 |
| Smolenskaya | 19 | 25 | 966,7 | 1604,5 | 1252 | 1750 |
| Tambovskaya | 27 | 29 | 1440,4 | 1079,2 | 1966 | 1933 |
| Tverskaya | 29 | 38 | 3595,7 | 4644,3 | 3356 | 4206 |
| Tulskaya | 18 | 21 | 2435,1 | 5974,9 | 2123 | 2867 |
| Yaroslavskaya | 30 | 46 | 5405,2 | 6938,5 | 2841 | 2874 |
| Moscow (city) | 727 | 748 | 264751,7 | 358214,8 | 14830 | 20649 |
| the CFD | 1327 | 1445 | 398597,2 | 530212,2 | 60829 | 77966 |
| the Russian Federation | 3604 | 3944 | 749797,6 | 1019152,4 | 193830 | 240054 |

According to the three major indices mentioned above there are leading regions of the CFD (not taking into consideration Moscow and Moscow region) – Yaroslavskaya, Voronezhskaya, Vladimirskaya, Kaluzhskaya and Tverskaya that possess high corresponding rates and can be interpreted as regions' performance in the innovation capacity boosting.

¹ www.gks.ru – website of the Federal State Statistics Service of the RF.

Despite clear progress there are some negative trends that are characterized by overall decrease of workforce employed in research field both in the CFD and in Russia on the whole (in the CFD the number of research staff decreased to 12624, in Russia it fell to 19142). The stagnation of the number of researchers and, as a result, thesis defenses is evident: in the CFD the number of researchers had fallen by 5575, in the Russian Federation – by 6003 people). Besides, we can observe a sharp decline of patents for inventions and utility models (see Table 2).

In our opinion the given tendencies speak for the urgent need to rethink the state authorities' policies in scientific staff training and the research activity fostering.

Considering spatial aspect of Russian territories' development we see the proportion growth of organizations implementing technological, organizational and marketing innovations. In this regard leading regions are Lipetskaya (18, 5%), Belgorodskaya (14, 8%) and Ryazanskaya (12, %). Moscow region shows the highest spending on technological innovations (136, 3 bln. rub.), Belgorodskaya oblast accounts for – 23,8 bln.rub, Tulsckaya – 16,1 bln. rub. and Lipetskaya – 15,3 bln. rub.

Table 2

Indices of negative trends in the CFD regions' innovation development

| Regions | Number of workforce engaged in research activity | | Number of researchers performing scientific investigations | | Number of PhD researchers, total | | Patents given | | | |
|---------------|--|--------|--|--------|----------------------------------|--------|---------------|-------|----------------|------|
| | | | | | | | Inventions | | Utility models | |
| | 2013 | 2017 | 2012 | 2016 | 2013 | 2017 | 2013 | 2017 | 2013 | 2017 |
| Belgorodskaya | 1227 | 1655 | 916 | 1247 | 375 | 489 | 116 | 155 | 89 | 86 |
| Bryanskaya | 665 | 688 | 627 | 320 | 52 | 78 | 40 | 42 | 63 | 103 |
| Vladimirskaya | 4919 | 5365 | 1674 | 1947 | 380 | 308 | 199 | 258 | 71 | 42 |
| Voronezhskaya | 10763 | 10654 | 6204 | 5763 | 954 | 947 | 521 | 460 | 154 | 101 |
| Ivanovskaya | 816 | 574 | 648 | 462 | 411 | 233 | 427 | 390 | 50 | 42 |
| Kaluzhskaya | 10528 | 9275 | 4438 | 3789 | 903 | 723 | 100 | 109 | 47 | 27 |
| Kostromskaya | 127 | 114 | 74 | 58 | 21 | 29 | 27 | 35 | 21 | 20 |
| Kurskaya | 3016 | 2719 | 1131 | 1032 | 177 | 176 | 152 | 264 | 77 | 87 |
| Lipetskaya | 379 | 530 | 191 | 366 | 126 | 226 | 53 | 47 | 29 | 20 |
| Moskovskaya | 85856 | 86579 | 37425 | 40415 | 7822 | 7667 | 1552 | 1436 | 786 | 549 |
| Orlovskaya | 677 | 837 | 348 | 335 | 129 | 145 | 86 | 57 | 41 | 29 |
| Ryazanskaya | 2440 | 2461 | 1158 | 1229 | 195 | 189 | 75 | 120 | 73 | 85 |
| Smolenskaya | 735 | 903 | 464 | 422 | 60 | 58 | 40 | 41 | 10 | 16 |
| Tambovskaya | 1644 | 1125 | 703 | 461 | 193 | 184 | 86 | 85 | 33 | 24 |
| Tverskaya | 4229 | 3971 | 2377 | 2392 | 455 | 334 | 81 | 38 | 101 | 64 |
| Tulskaya | 3499 | 4142 | 2596 | 3058 | 171 | 216 | 169 | 179 | 92 | 60 |
| Yaroslavskaya | 6148 | 6354 | 2778 | 2773 | 898 | 863 | 158 | 149 | 102 | 96 |
| Moscow (city) | 237419 | 224517 | 131138 | 126115 | 46375 | 41247 | 8699 | 5927 | 3055 | 1992 |
| the CFD | 375087 | 362463 | 194890 | 192184 | 59687 | 54112 | 12581 | 9898 | 4894 | 3315 |
| the RF | 727029 | 707887 | 372620 | 370379 | 109330 | 103327 | 23065 | 21037 | 12267 | 8376 |

This analysis of the CFD regions' development based on some indices of innovation activity illustrates that regions-leaders' social and economic potential

contributes to the production development, the implementation of innovative technologies into production processes that enables to produce innovative products of high demand.

Many analysts and researchers [1, 12, 19] believe that the New Industrial Revolution that deals with the production automating, the Internet technologies, big data analysis and environment virtualization, sets new vital priorities that assume absolutely new professional competences of employees. As practice shows all industrial revolutions are directly connected with social changes that have a great impact on people [15]. It leads to the redundancy of manual workforce and increase of intellectuals, the proportion of free-time and working hours is changing.

This period is marked by mass urbanization, the replacement of human workforce by machines that create social stratification and the rise in technological unemployment [10, 13]. Under these conditions there is a pressing need for professionals who are able to meet new requirements of such technological challenges, to operate «smart» machines correctly and use advanced technologies. Our analysis justifies the necessity of the education system transformation in line with labour market's new requirements which calls for reforming the institutions of specialized secondary and higher education.

Thus we can conclude that on the one hand technological development leads to living standards improvement which creates new human needs, but on the other hand it tends to aggravate social stratification. As we see it, in order to enhance social and economic potential of regions' spatial development, to implement advanced technologies into people's life it is essential to unite efforts of science, authority, business and society that can ensure their coordination and consistency and can provide for effective problem-solving.

Aimed at further effective managing of regions' stable spatial development we propose a complex of adjusting measures to help new high-tech products, to produce, technological innovations to implement, social environment to preserve and mass technological unemployment to prevent.

While designing these measures intended to guarantee regions' spatial development under the conditions of industrialization we need to adopt an integrated approach that can embody three key constituents: resources (potential development), capacities (development mechanisms) and usage (rational spending and saving) that contribute to the steady development of the individual territories and the country on the whole.

According to our investigation objective and the analysis of theoretical knowledge and methodological bases we think that the approach towards the creation of qualitative transformation system should be regulated and controlled on the permanent basis that ensures the territories' social and economic development by means of scientific, technical and technological transformations in industrial activity. In this regard the process of regulation is to be based on the following fundamental principles:

1. The adoption of systems approach to the object analysis that is a subsystem of a larger social and economic system, the study of its interconnection with other territories in the context of spatial changes and innovative transformations.

2. The monitoring of different aspects reflecting people's living standards under the conditions of technological transformations, such as economic welfare, education and healthcare provision, environmental assessment, etc.

3. The territory peculiarity and its specific resource potential should be taken into account.

4. The statistical and dynamic disproportions of the innovative and technological transformations implementing into territories' industrial production are to be thoroughly examined.

5. The adoption of scientifically credible approach towards the positioning of new material objects involved in industrial production as well as the old ones reconstruction is to be applied in line with the key features of territories' social and economic development (density, position, connectedness) and directions of industrial modernization of economy.

From our perspective these principles will provide for more effective management and improvement of industrialization processes within the framework of the country's and its regions' spatial development.

The major directions targeted to regions' steady spatial development and their safe entries into the new industrialized world are the following:

- The state support system of transdisciplinary investigations based on the premise of symbiotic nature of the New Industrial Revolution;
- The establishment of a unified system integrating innovative approaches and technologies (robotics, 3 D printers, vast amounts of data);
- The implementation of a well-targeted policy on labour market, the system development of professional capacity increase;
- The participation stimulating Russia's highly skilled IT-specialists to work out innovative software products designed for the economy's industrial sector;
- The establishment of social ecosystem aimed at the gradual implementation of technologies and their social projecting [17];
- The improvement of all education levels as well as grown-ups education;
- The regulation of professional mobility from the territories characterized by employees' low wages to the cities marked by well-paid employment in the same occupation (the problem-solving of wage gap in different countries);
- The demand increase for future work skills, the development and support of educational infrastructure and new training courses, the increase of the BRICS countries' mobility;
- The development of novel and adaptive thinking that guarantees an appropriate attitude of people towards new technologies, their understanding of the necessity of life-long education.

Conclusion

The research-based results show that the Fourth Industrial Revolution is distinguished by transdisciplinary nature of technologies and products. This vital aspect is a taproot for such technologies and products' further development and promotion. We believe that the holistic system that integrates different elements of social environment and high-tech production tends to self-development and responds to rapidly changing demands, is to become a core of territories' spatial development in the new context of high-tech industrial transformations. To ensure the country's economic development by means of new production technologies we are to overcome digital gap by investing into digital technologies. Besides, it is necessary to improve legislative framework that provides for business competition, for employees' professional competence in line with new economy's requirements and to enhance entrepreneurial activity. A special emphasis is to be made on leading regions that are capable to ensure a qualitative breakthrough in advanced technologies by means of their resource potential development and to create a solid basis for production modernization and innovation development of the country's industry.

For the modern management model of Russia's spatial development it is essential to create specific conditions for multilateral cooperation in the priority directions that are free from scientific, social and national restrictions. Consequently, it will contribute to the creation of the integrated system of cooperation between the authority, business and science on the whole territory of Russia that enables them to participate in the current processes of industrialization, to create new technological products and to guarantee the steady economic growth of individual territories as well as the country on the whole.

References

1. Belokrylova O.S. Smena tekhnologicheskikh ukладov ili 4-ya promyshlennaya revolyutsiya?: institutsionalizatsiya [Change of technological structures or the 4th Industrial Revolution?: institutionalization]. *Vestnik ekspertnogo soveta*, 2017, no. 3(10), pp. 3-10. (In Russ.)
2. Chetverikova O.N. Novaya promyshlennaya revolyutsiya i pyat printsipov energoinformatsionnogo razvitiya [The New Industrial Revolution and five principles of energy and information development]. *Energeticheskaya politika*, 2017, no. 5, pp. 39-48. (In Russ.)
3. Fattakhov R.V., Stroyev P.V. Prostranstvennoye razvitiye Rossii: vyzovy sovremennosti i formirovaniye toчек ekonomicheskogo rosta [Russia's spatial development: modern changes and formation of economic growth points]. *Sbornik nauchnykh statey II Mezhdunarodnogo foruma Finansovogo universiteta: V poiskakh utrachenogo rosta. Finuniversitet*, 2016, pp. 181-204. (In Russ.)
4. Fattakhova R.V. (red.) *Monitoring prostranstvennogo razvitiya Rossii s uchestom migratsionnykh protsessov: ispolzovaniye GIS-tekhnologiy: monografiya* [The Monitoring of Russia's spatial development according to migration processes: the implementing of GIS-technologies: monograph]. Orel, Orel GUET, 2017 (In Russ.)
5. Industrie 4.0: Mit dem Internet der Dinge auf dem Weg zur 4. industriellen Revolution». *Vdi-nachrichten.com* (in German). Available at: <https://tinyurl.com/yyeefjuk> (accessed: 15.09.2018).
6. Industry 4.0. Challenges and Solutions for the Digital Transformation and Use

of Exponential Technologies. *Deloitte*. Available at: <https://tinyurl.com/y2yvwcgj> (accessed: 27.09.2018).

7. Kochetkova L.N., Kozlova M.A. *Chetvertaya promyshlennaya revolyutsiya: sotsialnyye transformatsii i novyye trebovaniya k cheloveku* [The fourth industrial revolution: social transformations and people's new requirements]. *Sbornik nauchnykh trudov III Mezhdunarodnoy nauchno-prakticheskoy konferentsii: «Aktualnyye problemy i perspektivy razvitiya radiotekhnicheskikh i infokommunikatsionnykh sistem»*. Moskovskiy tekhnologicheskii universitet (MIREA), 2017, pp. 444-449. (In Russ.)

8. Long H. Stephen Hawking: Technology Is Making Inequality Worse. *CNN. Money* [Site]. October 12, 2015. Available at: <https://tinyurl.com/yxe97q3m> (accessed: 20.09.2018).

9. Makarova A.I. *Chetvertaya promyshlennaya revolyutsiya i tekhnologicheskaya bezrabotitsa: kakiye mery predprinimat gosudarstvu* [The Fourth Industrial Revolution and technological unemployment: what measures should be taken by the state]. *Mezhdunarodnyi molodezhnyi simpozium po upravleniiu, ekonomike i finansam, Kazanskii (Privolzhskii) federal'nyi universitet (Kazan')*, 2017, pp. 492-494. (In Russ.)

10. Malinina T.B. *Chelovek v kontekste sotsialnykh izmeneniy chetvertoy promyshlennoy revolyutsii* [A man in the context of social change in the Fourth Industrial Revolution]. *Nauka i biznes*, 2018, no. 3(81), pp. 162-165. (In Russ.)

11. Merenkova I.N., Nesterova N.N., Savenkova O.Yu. *Teoretiko-metodologicheskiye osnovy prostranstvennogo razvitiya territoriy i sistemy monitoringa* [Theoretical and methodological bases of territories' spatial development and the monitoring system]. *Sbornik materialov mezhdunarodnoy nauchno-prakticheskoy konferentsii: «Strategicheskkiye initsiativy sotsialno-ekonomicheskogo razvitiya khozyaystvuyushchikh subyektov regiona v usloviyakh vneshnikh ogranicheniy»*, Lipetskii filial Finuniversiteta, 2017, pp. 211-225. (In Russ.)

12. Mitroshin A.A., Shitova Yu.Yu., Shitov Yu.A. *Metody otsenki kachestva zhizni naseleniya i sotsialno-ekonomicheskoy*

differentatsii territoriy: monografiya [The assessment methods the population's life standards and socio-economic differentiation of territories: monograph]. Moscow, INFRA-M, 2018 (In Russ.)

13. Nosova S.S., Ryabtsun V.V., Norkina A.N. *Tsifrovaya ekonomika kak novaya model sovremennogo sotsialno-ekonomicheskogo razvitiya Rossii* [Digital economy as a new model of modern socio-economic development of Russia]. *Ekonomika i predprinimatelstvo*, 2018, no. 3, pp. 26-32 (In Russ.).

14. Shvab K. *Chetvertaya promyshlennaya revolyutsiya* [The Fourth Industrial Revolution]. Moscow, Eksmo, 2016.

15. Skhvediani A.E., Gorovoy A.A. *Chetvertaya promyshlennaya revolyutsiya kak osnova perekhoda k shestomu tekhnicheskomu ukkladu* [The fourth Industrial Revolution as the transition basis to the sixth technical mode]. *Sbornik materialov II Mezhdunarodnoy nauchno-prakticheskoy konferentsii: «Aktualnyye voprosy ekonomiki i upravleniya»*, 2017, pp. 55-59. (In Russ.)

16. The World Economic Forum Documentary: The Fourth Industrial Revolution. *YouTube.com* [Site]. Available at: <https://tinyurl.com/y96wokze> (accessed: 10.09.2018).

17. Yudina M.A. *Industriya 4.0: perspektivy i vyzovy dlya obshchestva* [Industry 4.0: prospects and challenges for society]. *Gosudarstvennoye upravleniye. Elektronnyy vestnik*, 2017, no. 60 (fevral), pp. 197-215. (In Russ.)

18. Yudina M.A. *Novaya promyshlennaya revolyutsiya kak vyzov gosudarstvennomu upravleniyu* [The New Industrial Revolution as a challenge to public administration]. *Gosudarstvennoye upravleniye. Elektronnyy vestnik*, 2017, no. 61 (aprel), pp. 76-95. (In Russ.)

19. Zарukina E.V. *Tendentsii i problemy razvitiya sfery truda v usloviyakh chetvertoy promyshlennoy revolyutsii* [Trends and problems of development of the labor sphere in the Fourth Industrial revolution]. *Sbornik nauchnykh statey «Regionalnaya ekonomika i razvitiye territoriy*. Sankt-Peterburgskiy gosudarstvennyy universitet aerokosmicheskogo priborostroyeniya, 2017, pp. 110-113. (In Russ.)

ОСОБЕННОСТИ ПРОСТРАНСТВЕННОГО РАЗВИТИЯ ТЕРРИТОРИЙ В УСЛОВИЯХ НОВОЙ ПРОМЫШЛЕННОЙ РЕВОЛЮЦИИ

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Цель: представляет собой разработку комплекса мер по адаптации регионов к новым условиям модернизации промышленности и внедрению технологических инноваций в условиях надвигающейся новой промышленной революции. *Обсуждение:* исследование основывается на общенаучной методологии, которая предусматривает применение системного подхода к решению проблем. В работе использованы методы эмпирического исследования (наблюдение, сравнение, сбор и изучение информации), текущего и перспективного анализа и синтеза теоретического и практического материала. *Результаты:* системообразующим ядром пространственного развития территорий в новых условиях высокотехнологических промышленных преобразований должно стать целостная система, образуемая совокупностью различных элементов социальной среды и высокотехнологичного производства, способная к саморазвитию и быстрой адаптации к различным изменениям. Для того чтобы новые технологии и производства могли обеспечить развитие экономики страны, необходимо преодолеть «цифровой разрыв», создавая благоприятные условия для увеличения инвестиций в цифровые технологии. Более того необходимо совершенствовать законодательную базу, обеспечивающую конкуренцию между компаниями, приводить квалификацию работников в соответствии с требованиями новой экономики и стимулировать рост предпринимательской активности в сформировавшихся областях деятельности. Особая роль должна отводиться регионам-лидерам, способным за счет развития своего ресурсного потенциала обеспечить качественный прорыв в сфере высоких технологий и создать прочную основу к модернизации производства и инновационного развития промышленности страны в целом.

Ключевые слова: индустрия 4.0, четвертая промышленная революция, пространственное развитие, регионы, ресурсный потенциал, социальные изменения.

Список источников

1. Белокрылова О.С. Смена технологических укладов, или 4-я промышленная революция?: институционализация 4. Индустрии на юре России // *Вестник Экспертного совета*, 2017, no. 3(10), с. 3-10.
2. Четверикова О.Н. Новая промышленная революция и пять принципов энергоинформационного развития // *Энергетическая политика*, 2017, no. 5, с. 39-48.
3. Фаттахов Р.В., Строев П.В. Пространственное развитие России: вызовы современности и формирование точек экономического роста // *Сборник научных статей II Международного форума Финансового университета: В поисках утраченного роста*, Финуниверситет, 2016, с. 181-204.
4. Фаттахов Р.В. (ред.) *Мониторинг пространственного развития России с учетом миграционных процессов: использование GIS-технологий*: монография. Орел, ОрелГУЭТ, 2017.
5. Industrie 4.0: Mit dem Internet der Dinge auf dem Weg zur 4. industriellen Revolution» // *Vdi-nachrichten.com* (in German). Доступно: <https://tinyurl.com/yueefjuk> (дата обращения: 15.09.2018).
6. Industry 4.0. Challenges and Solutions for the Digital Transformation and Use of Exponential Technologies // *Deloitte*. Доступно: <https://tinyurl.com/y2yvwcgj> (дата обращения: 27.09.2018).
7. Кочеткова Л.Н., Козлова М.А. Четвертая промышленная революция: социальные трансформации и новые требования к человеку // *Сборник научных трудов III Международной научно-практической конференции: «Актуальные проблемы и перспективы развития радиотехнических и инфокоммуникационных систем»*. Московский технологический университет (МИРЭА), 2017, с. 444-449.
8. Long H. Stephen Hawking: Technology Is Making Inequality Worse // *CNN. Money* [Site]. October 12, 2015. Доступно: <https://tinyurl.com/yxe97q3m> (дата обращения: 20.09.2018).
9. Макарова А.И. Четвертая промышленная революция и технологическая безработица: какие меры предпринять государству // *Международный молодежный симпозиум по управлению, экономике и финансам*, Казанский (Приволжский) федеральный университет (Казань), 2017, с. 492-494.
10. Малинина Т.Б. Человек в контексте социальных изменений четвертой промышленной революции // *Наука и бизнес*, 2018, no. 3(81), с. 162-165.
11. Меренкова И.Н., Нестерова Н.Н., Савенкова О.Ю. Теоретико-методологические основы пространственного развития территорий и системы мониторинга // *Сборник материалов международной научно-практической конференции: «Стратегические инициативы социально-экономического развития хозяйствующих субъектов региона в условиях внешних ограничений»*. Липецкий филиал Финуниверситета, 2017, с. 211-225.
12. Митрошин А.А., Шитова Ю.Ю., Шитов Ю.А. *Методы оценки качества жизни населения и социально-экономической дифференциации территорий*: монография. Москва, ИНФРА-М, 2018.
13. Носова С.С., Рябцун В.В., Норкина А.Н. Цифровая экономика как новая модель современного социально-экономического развития России // *Экономика и предпринимательство*, 2018, no. 3, с. 26-32.
14. Шваб К. *Четвертая промышленная революция* [перевод с английского]. Москва, Эксмо, 2016.
15. Схведиани А.Е., Горовой А.А. Четвертая промышленная революция как основа перехода к шестому техническому укладу // *Сборник материалов II Международной научно-практической конференции: «Актуальные вопросы экономики и управления»*, 2017, с. 55-59.
16. The World Economic Forum Documentary: The Fourth Industrial Revolution // *YouTube.com* [Site]. Доступно: <https://tinyurl.com/y96wokze> (дата обращения: 10.09.2018).
17. Юдина М.А. Индустрия 4.0: перспективы и вызовы для общества // *Государственное управление. Электронный вестник*, 2017, no. 60 (февраль), с. 197-215.
18. Юдина М.А. Новая промышленная революция как вызов государственному управлению // *Государственное управление*

ние. *Электронный вестник*, 2017, no. 61 (апрель), с. 76-95.

19. Зарукина Е.В. Тенденции и проблемы развития сферы труда в условиях четвертой промышленной революции

// Сборник научных статей «Региональная экономика и развитие территорий». Санкт-Петербургский государственный университет аэрокосмического приборостроения, 2017, с. 110-113.