

The impact of the digital economy on the development of cross-border areas

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Abstract. The article explores the importance of applying the directions of the digital economy for the Altai Krai, as well as the development prospects of “Smart Cities” in the region. The authors estimated the potential of the Altai Krai from the perspective of existing possibilities to have a successful digitization of the main directions of socio-economic development for a long-term period. The research was conducted taking into account the key strategic goals of the region as a cross-border territory, which were aimed at preserving the level of population, accumulating human capital, and ensuring its sustainable development.

Keywords: digital economy, business, smart city, cross-border cooperation, region

1. Introduction

The rapid development of information technology offers the economy new opportunities to develop and reduce business costs to fulfill its tasks, erasing geographical boundaries in the course of doing business, as well as accelerating global business processes. Avoiding the introduction of new information technologies is impossible. Leading regions of digitalization receive great business benefits and opportunities for the development of the economy as a whole.

In December 2016, on the instructions of the President of the Russian Federation, the development of the Digital Economy program was started. The program, approved in July 2017, considered the legal, technical, organizational, and financial conditions for the development of the digital economy and the possibility of its integration into the digital economy space of the member states of the Eurasian Economic Union (EAEU) [1]. In the future, the program should include projects in individual sectors, including health care, public administration, and the creation of a “Smart City”.

The concept of a “Smart City” considers the most important aspects of ensuring the processes of sustainable economic development and improving the quality of life through the use of information and communication tools and modern computer technologies in the economy, ensuring labor mobility, managing natural and labor resources, providing a comfortable environment, and solving management issues.

Considering the current state of affairs in the Altai Krai, it can be noted that the economic situation remains very tense, there is an increase in the level of inflationary processes, an increase in tension in the labor market.

To overcome the negative demographic trends and ensure the positive dynamics of the most important indicators of economic growth, a radical rethinking of the main development priorities, an exit to intensive high-tech forms of business, both within the region and with access to the processes

of cross-border cooperation, is required.

2. Materials and Methods

The following documents were used in the work: (a) strategic planning documents of the Russian Federation in the field of the information society, digital economy and smart cities; (b) a project “Strategies for the socio-economic development of the Altai Territory for the period up to 2035”; (c) the data of Rosstat and Altaykraystat, federal and regional statistical bodies. The study used methods of analysis, synthesis, comparison, systematization, etc.

3. Results

The study identified opportunities and prospects for improving the socio-economic situation of the region through the introduction of high-tech business practices, the further introduction of digitalization elements into the system of region’s management as a whole, and individual industry trends, taking into account cross-border cooperation in commerce, business, science, and education.

4. Discussion

The life of modern society is impossible without the use of information technology, this applies to both the economic and social spheres. Information technologies have led to a qualitative change in the conditions and instruments for the operation of medical institutions, industrial and commercial enterprises, financial institutions, educational organizations, etc.

The development of the IT sector in Russia is determined by the following documents: “The strategy for the development of the information technology industry in the Russian Federation for 2014–2020 and for the future until 2025” [2]; “The Strategy for the Development of the Information Society in the Russian Federation for 2017–2030” [3]; The State Program of the Russian Federation “Information Society (2011 - 2020)” [4].

The implementation of these documents is aimed at reducing the dependence of the country’s economy on the commodity sector, due to the growth of high-tech knowledge-intensive goods and services, growth of labor productivity, and increasing the technical level of production. In addition, the development of the IT industry contributes to the transition to a new post-industrial technological structure of society based on the knowledge economy.

In order to implement the Strategy for the Information Society Development in the Russian Federation for 2017-2030, the Digital Economy program was developed and approved, which addressed the creation of the necessary conditions for the development of a knowledge society, improving the well-being and quality of life of the population by ensuring access to quality goods and services produced in high-tech sectors of the economy. The most important aspect is the preparation of all segments of the population for the conditions of using new opportunities for digitalization, raising awareness and digital literacy, improving the availability and quality of public services for citizens, as well as ensuring information security.

Within the framework of this program, the most important is the process of creating “Smart Cities.” Smart city technologies include the following: Artificial Intelligence, Big Data and Predictive Analytics, Blockchain, 5G Communication Technologies, Internet of Things, Virtual, Augmented and Mixed Reality Technologies, Neuro Interfaces, Computer 3D Modeling and 3D Printing [5].

The British Standards Institute (BSI) considers a smart city as “the effective integration of physical, digital and human systems in an artificially created environment, with the goal of ensuring a sustainable, prosperous and comprehensive future for citizens” [6].

The Committee of Smart Cities, an institute of electrical and electronics engineers, uses the following definition: “A smart city unites technology, government, and society to provide the following characteristics: smart cities, smart economy, smart mobility, smart environment, smart people, smart, lively, intelligent control” [7].

Leaders of the IT industry, such as Cisco, Schneider Electric, IBM, Microsoft and UNIT, are engaged in the development of new solutions and technologies for smart cities [8].

The Center for Strategic Research published an expert-analytical report “Priority directions for the implementation of “smart city” technologies in Russian cities,” in which it was noted that the concept of “smart city” is interpreted widely and differently, but in all approaches the key role is played by the information and telecommunication technologies, which help most effectively support the current processes of city life through the involvement of citizens, business, and public authorities. As of today, according to the authors of the study, a smart digital city management is carried out on the basis of data (“data-driven city”), which are a key element of the urban ecosystem and its individual components (smart housing system, smart energy, smart transport, smart health, etc.) [9].

The total volume of Russia’s digital economy over the past six years has grown by 59%, this industry is growing almost nine times faster than the country’s GDP. This follows from the report of the international consulting company McKinsey “Digital Russia: A New Reality.” At the same time, digital household spending in Russia amounts to only 2.6% of GDP, while the average value of this indicator for technically developed countries is 3.6% [10].

The development of high-speed data transmission networks and an increase in the penetration rate of smartphones facilitate digitalization and make it possible to increase the mobility of the population. This global trend is also relevant for Russia, where the penetration rate of cellular services in 2017 was 200.3%.

A similar trend is observed in terms of the number of subscribers of fixed broadband and mobile Internet access (21.0% and 79.9%, respectively, in 2017). The number of Internet users also shows a growth trend from 64% in 2013 to 81.0% in 2018. Negative dynamics is observed in terms of fixed-line telephony density (including payphones) of 22.2% in 2017 compared with 31.4% in 2010, which also corresponds to the global trend.

Thus, a consequence of the development of the digital economy will be the definition of effective business models and the creation of prerequisites for cooperation. As a result, an access to modern services in the field of information technology and communications will become global (over 5 billion users). This will require solving the tasks of ensuring convenient and efficient identification of users, creating a set of working universal mechanisms of the “Internet of Things” and coordinating the development of new communication standards, including 5G, with the subsequent deployment of networks.

High technologies, including information and telecommunication, become the leaders in the socio-economic development of any territory. Today, the effectiveness and speed of decision-making directly depends on the level of information.

In recent years, the communications infrastructure in the Altai Krai, thanks to the implementation of federal targeted programs, regional programs and projects, as well as investment programs of telecom operators, has been developing quite dynamically.

In 2007-2018, a cellular coverage has been significantly increased. The telephone density (penetration) of communication per 100 population has increased 3 times, the number of subscribers is 2.1 times, and the number of base stations is more than 10 times. Today, 97% of the population of the region has a stable access to the mobile network, and the 4th generation communication networks in the LTE standard are deployed and operated.

As a result of the development of the multiservice network, the promotion of broadband Internet access services in all cities and districts of the Altai Krai has been ensured. Compared to 2006, the number of fixed broadband Internet access subscribers increased to 425 thousand, the number of subscribers in rural areas increased from several thousand to 100 thousand.

The geographical position of the region and its high transport accessibility provide ample opportunities for establishing strong economic and trade links at the interregional and international levels. A railway linking Central Asia with the Trans-Siberian Railway passes through the region. Across the territory of the Altai Territory there are highways connecting Russia with Mongolia, Kazakhstan, and Central Asian states.

The dynamics of demographic processes in the Altai Krai as a whole, repeats the trends of the considered processes in the Russian Federation, but has some regional features related to geographical

location, development of transport infrastructure, availability of natural and labor resources, etc.

Positive demographic trends include a decrease in natural population loss. About 54% of the population of the region are of working age. Labor resources of the Altai Krai are characterized by a high professional level, and they are able to ensure the effective functioning and development of the regional economy. A distinctive feature of the region is the high proportion of the rural population (43.6%, and it is 25.6% in Russia).

For the Altai Krai, as well as for Russia as a whole, the tendency of population aging is characteristic. The number of people older than the working age (women of 55 years and older, and men of 60 years and older) exceeds the number of people younger than working age (up to and including 15 years), constituting 27.2% of the total number against 19.1%.

The outflow of the working age population has a negative impact on the overall demographic situation in the Altai Krai. Migratory increase in population has consistently negative values, despite the consistently high level of arrival of migrants from foreign countries and from other regions of Russia. This trend continues, due to the labor migration of the working-age population and their families to more favorable living and labor market conditions in the regions. In 2005, the percentage of the working population was 63.2%, but it decreased to 53.7% in 2017, which is slightly lower than the corresponding figures for the Russian Federation – 56%, and the Siberian Federal District – 55.7% [11].

Also, there is an internal migration of the population on the territory of the Altai Krai, mainly from the rural settlements to the cities. At the beginning of 2019, the share of the urban population was 56.4%.

According to Rosstat's operational data, an average monthly wage of workers at the beginning of 2019 was 23,941 rubles, which is the absolute minimum among all regions of Russia. The same indicator for the Russian Federation as a whole is 42,263 rubles, and it is 36,851 rubles for the Siberian Federal District. In 2017, the growth rate of the average per capita money income of the population was 101.3% against 103.7%. Real disposable incomes of the population decreased by 4.1%, which was higher than the national average by 0.3%. According to Altaikraistat, more than 83% of the population's cash income is paid monthly for goods, services, and obligatory payments and contributions, while the share of spending on savings is reduced.

This situation contributes to an increase in the migration of the working-age population outside the Altai Krai, both to the neighboring regions of Siberia with a higher level of wages and to large cities in central Russia, such as Moscow, St. Petersburg, etc.

The tendency to reduce the rural population is natural for high-tech agricultural production. An active agrarian policy and a radical change in living conditions in rural areas will reduce the outflow of the working age population, and significantly change its age structure. The production of high-quality, environmentally friendly agricultural products that are in high demand all over the world will make it possible to significantly increase cross-border trade.

The introduction of the concept of a smart city will contribute to the development of the production of high-tech goods and services, increase labor productivity, increase the competitiveness of the finished product, and increase the well-being of the urban population. This will provide the prerequisites for increasing the export potential of industrial and intellectual products, within the framework of cross-border cooperation.

5. Conclusion

The draft strategy for the socio-economic development of the Altai Krai for the period until 2035 defines the mission of the Altai Krai. The region is the leading agro-industrial export-oriented region in Siberia and the Far East. This is a territory of a creative and comfortable living environment that creates innovation [12].

The key role of the region in the all-Russian and global division of labor is the leading agro-industrial export-oriented region. Comfortable living environment is favorable material and non-material conditions of social and cultural environment, engineering infrastructure, open opportunities

for creative self-realization of a person. This forms high living standards, satisfaction, happiness, and the desire to live in such a region.

In order to activate various creative initiatives, it seems necessary to implement the following areas and projects, such as projects “Digital Economy” (the region selected as a pilot area for digital regional transformation of the agricultural sector), “Labor productivity,” “Safe City,” “Smart City,” “Smart Energy,” as well as the projects on the digitization of the regional health care system, etc.

References

- [1] Government of the Russian Federation 2017 *Order “On the approval of the program “Digital Economy of the Russian Federation”* (July 28, 2017 No. 1632-p)
- [2] Government of the Russian Federation 2013 *Order “On approval of the Strategy for the development of the information technology industry in the Russian Federation for 2014–2020 and for the perspective up to 2025”* (November 1, 2013 No. 2036-p)
- [3] Presidential Executive Office 2017 *Decree on the Strategy for the Development of the Information Society in the Russian Federation for 2017-2030* (May 9, 2017 No. 203)
- [4] Government of the Russian Federation 2014 *Resolution “On approval of the state program of the Russian Federation “Information Society (2011–2020)”* (April 15, 2014 No. 313)
- [5] Moscow Information Technology Department 2019 *Moscow's digital strategy “Smart City - 2030”* Available at: www.mos.ru (Accessed 10 04 2019)
- [6] Musa S 2016 *A “smart city” roadmap* Available at: https://www.academia.edu/21181336/Smart_City_Roadmap (Accessed 10 04 2019)
- [7] *About IEEE Smart Cities* n.d. Available at: <https://smartcities.ieee.org/about> (Accessed 10 04 2019)
- [8] *Intellectual cities (Smart Cities)* 2019 Available at: <http://www.tadviser.ru/index.php/> (Accessed 10 04 2019)
- [9] *Priority directions for the introduction of Smart City technologies in Russian cities.* Available at: <https://www.csr.ru/wp-content/uploads/2018/06/Report-Smart-Cities-WEB.pdf> (Accessed 10 04 2019)
- [10] McKinsey 2017 *Digital Russia: A New Reality* Available at: <https://www.mckinsey.com/~/media/mckinsey/locations/europe%20and%20middle%20east/russia/our%20insights/digital%20russia/digital-russia-report.ashx> (Accessed 10 04 2019)
- [11] Vdovkina E, Poddubnova S, and Shapovalova S 2019 *Causes of the deteriorating demographic situation in the Altai Krai Economy vector 3* Available at: http://www.vectoreconomy.ru/images/publications/2019/3/regionaleconomy/Vdovkina_Poddubnova_Shapovalova.pdf (Accessed 10 04 2019)
- [12] Ministry of Economic Development of the Altai Krai 2019 *Draft Strategy for the Socio-Economic Development of the Altai Krai for the Period until 2035* Available at: <http://econom22.ru/prognoz/strateg/index.php> (Accessed 10 04 2019)