



# Strategy of innovation territorial clusters in the aspect of the growth of the russian digital economy competitiveness

## Estrategia de grupos territoriales innovadores en el aspecto del aumento de la competitividad de la economía digital de Rusia

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#### ABSTRACT:

The paper analyzes the model of the digital economy formation in the system of network partners implementing collective actions within a single territory, common identity and joint obligations in the aspect of forming a cluster business in order to select priority areas in the development of science, engineering and digital technologies that should be aimed at upgrading the economy in order to increase its competitiveness; it has been proved that the formation of innovative territorial clusters (ITCs) multiplies the productivity of production factors and serves as the main mechanism for balancing the economy in the context of global digitalization.

**Keywords:** Innovative territorial cluster (ITC), cluster management, synergistic effect

#### RESUMEN:

El documento analiza el modelo de formación de la economía digital en el sistema de socios de la red que implementan acciones colectivas dentro de un solo territorio, identidad común y obligaciones conjuntas en el aspecto de formar un negocio de clúster para seleccionar áreas prioritarias en el desarrollo de la ciencia, la ingeniería, y tecnologías digitales que deberían apuntar a mejorar la economía para aumentar su competitividad; Se ha demostrado que la formación de agrupaciones territoriales innovadoras (ITC) multiplica la productividad de los factores de producción y sirve como el mecanismo principal para equilibrar la economía en el contexto de la digitalización global.

**Palabras clave:** cluster territorial innovador (ITC), gestión de cluster, efecto sinérgico

## 1. Introduction

Today, the main task in the development of the modern economy is the use of digital technologies. The use of digital technologies leads to the economy digitalization causing production to become more flexible, automated with access to robotics, which contributes to the

growth of its competitiveness. The main barrier to the economy digitalization in Russia is personnel. In this regard, it is necessary to train domestic specialists in the field of machine learning. The state shall support the development of digital technologies according to plan, with the development of legislation, with the formation of sales markets, with support at international trading platforms. Considering that all the developed countries of the world every year tighten the rules for protecting their manufacturer in key sectors, Russia has to develop its own enterprises that make modern technological products. And if here is no such enterprises, the entire digitalization of the economy will make the country dependent on import of digital technologies from abroad.

On July 28, 2017, the program "Digital Economy of the Russian Federation" was approved, which defines goals, objectives, directions and deadlines for implementing the basic measures of state policy to create the necessary conditions for the development of digital technologies in Russia. Already in August, the composition of the subcommittee on the digital economy was approved, as well as the functional structure of the program management system, the rules for the development of measures for the program implementation.

In the modern economy, incentives for creating a digital business are becoming sustainable, as business entities can freely join in networks and "work together". This work is done by markets at the territory level in ITC mode, expressed as an interactive dialogue between its participants. ITC participants put forward cluster initiatives and in the course of cooperation find the vector of "smart specialization". The state in turn acquires a new functional role to form and strengthen ties in the business environment in a certain territory, encouraging the continuous formation of innovative systems and supporting the monitoring of the digital business quality in the ITC system.

Therefore, it is not accidental that the works of well-known foreign economists focused on a special innovative economic process - a process based on a stable partnership of interconnected participants with the goal of constantly searching for new opportunities for competitiveness growth, focusing on innovations as a result of practical use of cluster innovations in the mode of the economy spatial development. Thus, it turns out that with the development of cooperation between economic institutions through the formation of stable vertical and horizontal ties that determine the effectiveness of all its components, the processes of digitalization of economic activities within territorial zones are stimulated and a high level of their competitiveness and the country as a whole is ensured.

The objective of this paper is to show how, based on the formation of ITC, it is possible to ensure the growth of the Russian digital economy competitiveness.

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## **2. A conceptual approach to analysis of the digital economy**

"Without a digital economy, Russia has no future," Vladimir Putin, the President of the Russian Federation emphasized (Putin: without a digital economy, Russia has no future, 2018). Digital economy is positioned as the newest economy in the scientific literature already for a quarter of a century. There is an opinion that "conditionally called "digital economy" actually brings in nothing qualitatively new, it only reveals quantitative changes, therefore its use is possible in the regulation of the economy." (Digital Economy: Some Aspects pro et contra ("Artificial Intelligence", Blockchain and Cryptocurrency, Labor Productivity), 04). Still, the concept of the DE does not have a strict interpretation in the scientific literature. In the broad sense of the word, we propose to mean the entire reproduction process of a social product (production, distribution, exchange and consumption of goods and services) using this term, based on the use of the whole spectrum of digital technologies. In a narrow sense - based on the use of the Internet and its derivatives.

Therefore, we should recognize that the modern market economy is evolving into a new technological order. Let's call it digital, although the structure of the Russian economy is still very far from post-industrial. Therefore, Russia will have to very quickly go through a long way to digitalize the economy, or make a breakthrough, as has already happened many times in Russian history. The world is on the verge of adopting a new, "digital" paradigm of economic development, where the Internet will take first place, and artificial intelligence will become a reliable mechanism of forced transformation and control over all processes of a person's life, including spiritual life. World practice shows that the modern economy of developed countries can already be called

digital. S.S. Nosova rightly emphasized that "the digital economy provides the world economic superiority of the country that embodies it." (Nosova, 2017)

Often they say that engineering and technology are in the first place in the system of economic growth factors. This is undeniable. But this is not a case in digital production. Very important are the objects of digital infrastructure represented by computers, supercomputers, gadgets, the wide use of which, along with the Internet, actually marked the beginning of the digital revolution, as well as industrial revolution 4.0. No one will deny the importance of digital innovations. In the history of technological evolution, there are six periods, each of them has formed a certain type of technological pattern. Currently, the 6th type is under formation. Therefore, it is no coincidence that structures change. As soon as the core of the structure ceases to generate income, it will be replaced by a new technological structure born in the past structure. Thus, the following became the core of the fifth structure: electronics (which was used as the element base for creating devices for receiving, transmitting, processing and storing information primarily in the military field), computers, information technologies, space exploration. In essence, in the fifth structure, a digital substructure has formed. Thus, the National Project "Digital Economy", intended for 2019-2024, includes six federal projects. "The total amount of funding is more than 1.5 trillion rubles." (The government has published the parameters of national projects, 2019)

The DE is rapidly changing the face of modern business. It creates a new digital space, provides access to a substantial data set to numerous participants in the world economy. At present, it is proposed to consider integration from the position of new public relations emerging in the DE system using electronic technologies, information infrastructure and services, technologies for analyzing large amounts of data and forecasting in order to optimize production, distribution, exchange, consumption and increase the level of socio-economic development of Russia.

Eventually, the economy digitalization strategy contributes to the expanded scale of production and exchange, increased market value of enterprises, more efficient use of the means of production and labor, both in the field of material production and the service sector, and, most importantly, increased competition and change in the existing style of economic management. Digital dividends of the modern economy consist in the fastest provision of customers with new information services and goods that will shape the markets of the future.

In general, the DE implementation mechanism identified creates a new base for further research and solving practical problems in the development of the Russian economy for the future, in particular, increasing the competitiveness of its economy through more active use of digital technologies.

It must be admitted that in the DE conditions, material production does not disappear as the basis of the life of human society. And it will not disappear as long as human society exists. This concept is eternal. Therefore, it is correct to emphasize that the concept of the digital economy has begun to go beyond the commercial aspect of buying and selling electronic products on the Internet. Today, this idea involves the use of virtual processes as part of the activities of large companies and corporations.

Thus, a digital economy is a business activity based on digital technologies that promote the production of electronic goods (software, computer games, e-books, widgets, etc.) and services (e-commerce, customer consultations online without subscription fees, audio greetings, etc.). Hence, it must be admitted that all of the above concepts are new categories and they require recognition and careful analysis by the scientific community in order to receive digital dividends. Thus, total digitization is an objective, inevitable process and it is impossible to stop it.

Building the DE is a systemic improvement of the whole country, including an increase in the efficiency of doing business, an increased standard of living of the population, and public administration. The main task of the DE as a new control system is to determine the flow of transfers (exchange), where the counterparties must make a joint decision on their magnitude. Demand and production controllability changes. Each agent offers its own plan for the magnitude of supply or demand flow. It depends on the values of specific information variables (prices, quantity, inflation, interest, currency exchange rates), and their values bring the agent information about the state of the entire system. Plans that are allowed by the existing economic relations are described by institutional (contractual) ties that contain strict information variables. It is proved that the digital economy is used only as a means to achieve consistency. This means that:

- 1) digital laws will be the same for all subjects,
- 2) transactions will not be subject to corruption,

3) digital business processes will be executed exactly and on time.

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### 3. Methods and Materials

Digital technologies provide access to a substantial data array to numerous participants in the global economic space. Generated "big data", along with other technologies, are becoming one of the leading assets of ITC. Moreover, national cluster programs for the development of a new-generation economy are under development, including the development and introduction of high technologies, analysis of "big data" and forecasting, the introduction of new management methods. Properties of digital technologies can help solve pressing social and global ITC problems, simplifying communication between science, business, government and civil society, increasing productivity, creating new opportunities for entrepreneurship and work, getting education and constantly raising and expanding professional qualifications, allowing for special needs of socially disadvantaged groups, creating new opportunities for socially significant scientific research and mitigating the risks of changing climate, lack of drinking water and food, lack of energy, and others. Digital technology contribute to the creation of "digital ITC".

World practice shows that digital ITC is fundamentally changing the form of links between business, people and government. This relationship controls their actions in relation to the use of labor, raw materials, machines, equipment, etc. and generates artificial intelligence, and robots along with it. All this is a product of digital ITC. And this is already the case both in the leading countries and in Russia (but to significantly less extent). Ideally, such an approach would also have the export potential of a regional (EAEU, SCO, BRICS) and global scale. For Russia, this will be a real breakthrough in order to become a leader in today's ITC digitalization race.

ITC digitalization makes business management transparent. It provides new organization management capabilities using big data technology, analytics and forecasting. However, this increases the risk of information leaks, provides the ground both for fraud, and also for real sabotage (since attackers can gain access to equipment control). All this requires an increase in the level of protection, the allocation of additional investments in information security.

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### 4. Discussion

M. Porter defines a cluster as "geographically concentrated groups of interconnected companies, specialized suppliers, service providers, firms in relevant industries, as well as organizations related to their activities (for example, universities, standardization agencies, trade associations) in certain areas competing, but at the same time working together." (Porter, 2003)

According to the Marxist interpretation, material production is the basis of the life of human society. Today, digital technology determines the size and quality of ITC. Competition in the digital economy is not determined by the demand and supply of manufactured goods and services, but by the supply and demand of new technologies. In this regard, the main productive force becomes not just a person with its physical and mental ability to work, but a creative (cognitive) person who is able to strategically lead production to new technologies. And those countries that are currently actively using them in production will be ahead of other countries. It is a general trend. It is inevitable. This is the law of economic development. In a number of countries, including Russia, a total digital transformation of the entire economic and social life is required. It is a complicated process. It bears costs. It requires active participation of the state and business structures. Government programs for the development of the digital economy should not be aimed at developing business in the field of digital technologies, with the help of which you can create, save, disseminate, transfer certain information or provide services, but to training staff to manage DE development on the basis of new education, health care, culture.

Initially, the actually implemented cluster was studied from the standpoint of the development of specific territories as a necessary Foresight management technology in decision-making. This management approach did not include an innovative, or creative component. Adoption of the innovation cluster as a new tool for managing the economy required a deep study of cooperation between R&D, business and government control. If we talk about the degree of innovation character of the cluster, we should analyze the partnership of interrelated economic entities in order to ensure the innovation of the economic activities of the clusters. In this aspect, we can talk about the formation of ITC. What is ITC?

ITC "is, as we may say, continuum Lat. continuum — continuous) - various activities that ensure the growth of innovative production." (Nosova S. S., 2017)

In general, the ITC business activity is aimed at solving such tasks as:

- improving the competitiveness of enterprises and organizations, the industry, improving the quality of life of the population in their home regions;
  - development of digital, industrial, transport, energy, engineering, housing and social infrastructure;
  - attraction of investment and skilled labor force to the regions;
  - ensuring effective support for the activities of enterprises from the consolidated budget of the Russian Federation and development institutions, as well as extra-budgetary sources;
  - formation and development of effective mechanisms of public-private partnership in nuclear energy;
  - development of international cooperation and integration. World practice shows that clustering in ITC mode contributes to the creation of digital technologies. In the modern economy, it is considered as a driver that determines the transformation of the traditional economy into a digital one. On June 21-23, 2016 the DE Development Ministerial Meeting took place in Cancún (Mexico). The Ministerial Declaration notes nine main objectives of the DE development (Ministerial meeting in Cancun. Look in the Digital Future., 2019).
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## 5. Result

The concept of the formation and development of innovative territorial clusters is based on studying and analyzing the conditions and prerequisites in the country for cluster development of the national economy, identifying problematic issues hindering the formation of clusters, and determining the best methods and ways to solve them, developing directions for implementing state cluster policy in the context of the national model of socio-economic development and the definition of the organizational and legal basis for the formation of the system of state support for cluster projects.

The prerequisites for cluster development of the Russian economy were the gradual reformation of property relations, which envisaged the formation of a significant sector of small and medium-sized businesses, an investment and structural rebuilding of the economy, aimed at gradually replacing traditional industries that had exhausted their life cycle on the existing technological base with high-tech industries using the technologies of the 5th and 6th technological orders.

The purpose of the state cluster policy is to create conditions for increasing the level of competitiveness of the national economy through the introduction of a cluster development model. State support for cluster development of the economy provides for subsidizing the costs of creating and organizing the activities of cluster development centers.

The formation and development of territorial clusters is an effective mechanism for attracting foreign direct investment and enhancing foreign economic integration, as well as a result of the accelerated build-up of infrastructure and personnel potential, development of a network of competitive suppliers and service organizations, ensuring the necessary consideration of business needs in the framework of territorial planning mechanisms. Territorial clusters play an important role in the economic development of the leading countries and regions of the world. The development of clusters stimulates the increase in labor productivity, the formation of new companies and the creation of new jobs, contributes to the growth of the innovation potential of the territories, the formation of competitive advantages and the unique look ("brand") of a region or territory that promotes investment in the regions. The leading foreign countries have a significant number of examples of implementation of state support programs for the development of territorial clusters, including, among other things, organizing a competitive selection of programs that stimulate the growth of territorial clusters and allocate targeted budget financing for their development. In the overwhelming majority of cases, support programs are long-term (from 5 to 10 years), and this is recognized by leading experts as one of the key factors for the success of cluster policy implementation. The inclusion of domestic clusters in the global value-added chains can significantly raise the level of the national technological base, increase the speed and quality of economic growth by increasing the international competitiveness of enterprises in the cluster, by: introducing the best available technologies and the advanced equipment; gaining access to modern management techniques and special knowledge; obtaining opportunities to enter highly competitive international markets. At the same time, the under-utilization of the potential to implement the mechanisms of cluster policy hinders the pace of economic development of the country's regions.

Note that this is about "data in digital form." The question is: whether economic analysis didn't have data in digital form before? It had. Everyone knows the statistical indicators characterizing

the results of economic activity both at the macro, meso and micro levels, and also at the level of the world as a whole.

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## **6. ITC as a tool for increasing competitiveness of the digital economy in Russia**

ITC creates a new digital space and provides access to a substantial data set to numerous participants in the global economy. Generated "big digital data", along with high technologies, are becoming one of the leading assets of ITC.

Formation of ITC solves a number of problems, among which the problem of ("digital divide"), or asymmetric information, is particularly distinguished. (Nosova S. , The Entrance of Modern Economy of Russia Onto the New Trajectory of Growth, 2017) Due to asymmetric information, dishonest sellers may offer lower quality (cheaper to manufacture) product, deceiving the buyer. The emergence of ITC greatly facilitates the process of information exchange among consumers, allowing to find out directly the characteristics of the product, or its reputation, that is, ITC reduces information divide. Since in the economy of the information pattern, the key factors of economic activity are data represented in digital form, the ITC whose economy is based on the most advanced digital technologies, including creation of new products and services, has a competitive advantage.

In this regard, ITC's digital space can be regarded as the phenomenon of cluster integration, one of the values of which is creating new digital platforms that set new professional standards, develop competition and form dynamic ratings of their participation in the country's economy. (Nosova, Norkina, & and other, The digital economy as a new paradigm for overwhelming turbulence in the modern economy of Russia, 2018). Structuring huge data flows and processes in the digital economy allows the use of algorithmic regulation and greatly simplifies the tasks of analysis and synthesis of added value chains. Saturation of ITC with computers itself will not lead to a qualitative change in their activities. The introduction of new digital technologies (DT) implemented using computers, can lead to a qualitative change. There is only one way out - it is necessary to choose those basic FT, without which the development of ITC is not possible now. Therefore, it is necessary to pay special attention to the methods of building and the structure of communication channels of local computer networks, to choose modern digital channels, which include: Internet, Internet media: media advertising, search, affiliate programs, sponsorship, e-mail and viral marketing, mobile platforms, custom content, Digital Signage, updated television - IPTV (English Internet Protocol Television) (IP-TV, IP television) - a technology (standard) of the digital television in data transmission networks via IP protocol used by digital cable television operators. This is a new generation of television. It should not be confused with Internet TV which is transmitted streaming video and is available to the user directly, without intermediaries (operating companies).

The innovative atmosphere for solving the problems of digitalization of the national economy must form in Russia as a whole. "Digital economy, as rightly emphasized, focuses on reducing average costs by reducing the cost of market transactions when entering into contracts for the production and sale of products as a result of their movement from the market system into the field of functioning of the company itself, and thus maximizes profits." (Nosova & and other, Digital Technologies as A New Vector The Growth of Innovativeness and Competitiveness of Industrial Enterprise, 2018)

The development of ITC should be accompanied by concerted actions between interested government and commercial structures and be combined with the efforts of the global community. In this case, ITC will be an incentive for structural and technological rebuilding and modernization of the national economy. Thus, ITC fits well into the digital economy, which determines the needs of institutional and financial globalization, which provides a solution to two problems - immediate access to the maximum amount of information and sales through social networks, blogs, wiki resources, mobile phones and other modern digital technologies. ITC, based on the digital economy, is moving to the widest possible market within the global scale, online, thereby becoming an effective trading platform in the globalization system of the world market. Based on the fact that the main provision of the digital economy is the consideration of digital data as a specific resource that differs from traditional factors of production: labor, land, capital. The concept of rarity is not applicable to such a resource. This provision is confirmed in economic practice. The self-growth of the digital economy in the process of ITC growth makes this resource inexhaustible. In this case, the DE will be an incentive for structural rebuilding and modernization of the national economy.

Digital technologies in the ITC system will provide access to reliable sources of knowledge, will replace or strengthen human mental work, where the possibilities of using artificial intelligence and solving the problems of production robotization will increase. At the same time, the production itself will change - its product will become more "information-capacious," which means an increase in the share of innovation, design and marketing in its value. "In general, the above mechanism for implementing the digital economy creates a new base for overcoming turbulence in the development of the Russian economy in the future, in particular, increasing the competitiveness of its economy through more active digital entrepreneurship." (Nosova & and other, The Strategy of the Digital Transformation of the Russian Economy in the XXI Century, 2019)

The ITC in the digital economy system is an important lever of economic development, developing new accelerators of competitiveness growth in the Russian digital economy, which include: 5G technology, cloud technologies, big data, Internet of things, artificial intelligence

All the above drivers to the growth of the DE competitiveness can help solve pressing social and global ITC problems, simplifying communication between science, business, government and civil society, increasing productivity, creating new opportunities for entrepreneurship and work, getting new education and constantly raising and expanding professional qualifications, allowing for special needs of socially disadvantaged groups, creating new opportunities for socially significant scientific research and mitigating the risks of changing climate, lack of drinking water and food, lack of energy, and others.

There is no doubt that the organizational mechanism of innovative entrepreneurship should be flexible enough to capture new technological opportunities and adapt them to the needs of society. The design should be preceded by an analysis of the prioritization systems of critical technologies available in developed countries, and identification of modern trends on the basis of their choice and implementation methods. In terms of the DE growth, the Russian state plays a decisive role.

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## 7. Conclusions

In general, the above ITC implementation mechanism creates the necessary basis for further research and solving practical problems of the digital economy development.

1. ITC is creating new digital space, opening up access to a substantial array of digital data to its members through the use of digital technologies, digital infrastructure and services, technologies for analyzing large amounts of data and forecasting to optimize production, distribution, exchange, consumption of material goods / services and increasing the level of socio-economic development of Russia.

2. ITC is an algorithm or rules for its participants to form a digital business and change its "reality" of functioning in the event of a change in digital technologies. This means that cluster forces can unite and almost instantly transfer the system from one state to another, as well as act as strategic tools for forecasting and the optimal choice of innovative entrepreneurship.

3. ITC, acting as a basic element of the DE formation, can fulfill its mission to become the pole of the digital economy growth, supporting the competitiveness of regional economies, and through them - the national economy.

4. Russian ITCs are intensively using the latest digital resources to ensure the openness of the economy and improve the quality of economic growth. As a consequence, there is a change in the role of the employee in economic development, which, in addition to a high level of professional competence, must be able to effectively use digital data.

Hence the "key rule" of the Russian ITCs: to stimulate the digitalization of the Russian economy in order to ensure the growth of its competitiveness.

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