

*Asesorías y Tutorías para la Investigación Científica en la Educación Puig-Salabarría S.C.  
José María Pino Suárez 400-2 esq a Lerdo de Tejada, Toluca, Estado de México. 7223898475*

RFC: ATI120618V12

**Revista Dilemas Contemporáneos: Educación, Política y Valores.**

<http://www.dilemascontemporaneoseduccionpoliticayvalores.com/>

**Año: VII      Número: Edición Especial      Artículo no.:70      Período: Octubre, 2019.**

**TÍTULO:** Formación y desarrollo de la infraestructura de emprendimiento innovador en la economía de la información.

**AUTORES:**

1. Ph.D. I.A. Khasanshin.
2. Ph.D. A.B. Shtrikov.

**RESUMEN:** El artículo analiza el desarrollo de la infraestructura del espíritu empresarial en una economía moderna e innovadora. La metodología es la teoría de la infraestructura del emprendimiento innovador y el modelo cibernético de una empresa innovadora. Los autores llegan a la conclusión de que existe una relación entre los sujetos del emprendimiento innovador y los subsistemas de la infraestructura del emprendimiento innovador. La formación del soporte de infraestructura y las funciones de infraestructura del emprendimiento innovador se llevan a cabo en forma de un sistema jerárquico.

**PALABRAS CLAVES:** emprendimiento innovador, infraestructura, economía de la información, sistema socioeconómico, entorno de la empresa.

**TITLE:** Formation and development of the infrastructure of innovative entrepreneurship in the information economy.

**AUTHORS:**

1. Ph.D. I.A. Khasanshin.
2. Ph.D. A.B. Shtrikov.

**ABSTRACT:** The article analyzes the development of the infrastructure of entrepreneurship in a modern innovative economy. The methodology is the theory of the infrastructure of innovative entrepreneurship and the cybernetic model of an innovative enterprise. The authors come to the conclusion that there is a relationship between the subjects of innovative entrepreneurship and the subsystems of the infrastructure of innovative entrepreneurship. The formation of infrastructure support and infrastructure functions of innovative entrepreneurship is carried out in the form of a hierarchical system.

**KEY WORDS:** innovative entrepreneurship, infrastructure, information economy socio-economic system, enterprise environment.

**INTRODUCTION.**

Most studies on the infrastructure of entrepreneurship do not draw the line between the concepts of “infrastructure” and “infrastructure support”. They are either used as synonyms (Yakovleva, 2005), or only one of them is used (Fedko, 2005). In our opinion, the infrastructure provision of innovative business activity is the process of functioning of infrastructure institutions, the use of infrastructure tools and the organization of infrastructure activities by the subjects of the infrastructure of innovative entrepreneurship.

At present, in Russian economy, there is a process of the formation of new types and forms of management, which have a mixed and multi-structured character. As a result, one of the most acute problems of national and regional development is the technological multistructure of production.

Along with the newest productions, production and their infrastructures, which are preserved from obsolete technological structures that are no longer sources of economic growth continue to function. National and regional industrial policy should be aimed at "the systematic development of high technologies of the fifth technological order and nanotechnologies (in the long-term perspective) in the formation of the sixth technological order" (Ivanchenko and Ivanchenko, 2007). In addition, it is necessary to "repeatedly increase innovation and investment activity, strengthen the state's influence on economic dynamics, while ensuring the new quality of its development" (Kuchukov, 2009).

Thus, at the regional and intrafirm level, the tasks of establishing the production infrastructure of these technological structures are being actualized, designed to help create favorable conditions for solving "modern problems of innovative development of production, reproduction and the economy as a whole" (Ivanchenko and Ivanchenko, 2008).

In the domestic science and practice, the division of the region's infrastructure into production and social was established. In the first case, freight transport, communications, power engineering and logistics are usually considered, and in the second case - passenger transport, social and cultural services, trade, health care.

In the traditional division of infrastructure, print and other media, scientific information services, subsystems that track environmental and demographic status, administrative and political institutions, financial and banking structures generally fall out of sight (Golts, 2000). Modern researchers have proposed options for improving this classification, however, the place of the infrastructure of innovative entrepreneurship in them, as a rule, is not indicated.

Most of the economically developed countries are currently experiencing trends in the transition to the information economy and the corresponding changes in the system of innovative entrepreneurship (Table 1).

Table 1 - The development of entrepreneurship in the evolution of the socio-economic system  
(Khomenko, 2015).

Characteristics	Type of social-economic system		
	pre-industrial	industrial	post-industrial
Type of reproduction	Reproduction, aimed at ensuring a stable existence	Development-oriented reproduction	Reproduction, aimed at the constant production of new
Dominant sphere of entrepreneurship	Mining sector	Transformational sector, distribution services, services to manufacturers	Knowledge production sector, information technology production sector and information and cultural services distribution sector
Limiting factors of development of entrepreneurship	Earth	Capital	Information and science-technical progress
Regulator of innovation entrepreneurship	Resource limitation	Prices	State and corporative planning and their correlation
Main goals of entrepreneurship	Saving business	Profit-making	Achieving the effectiveness of entrepreneurship, sustainable profits
Source of innovation entrepreneurship development	Fertility of the earth Population growth	The development of economic activities that create a multiplier effect	Informatization of the infrastructure of innovative entrepreneurship and the intellectualization of entrepreneurial activity

The microenvironment is not only influenced by a specific subject of innovative entrepreneurship and responds adequately to its market behavior, but also has a noticeable formative influence on the style and nature of entrepreneurial activity. The microenvironment is in the focus of market processes, reflecting the most significant market fluctuations. Its elements are in a state of constant mutual influence, when each of them is not only able to cause changes in the behavior of the other but is also forced to adapt to these changes (Asaul, et al., 2008).

The development of innovative business entities is the result of their constant interaction, implementation of infrastructure functions in relation to each other during the reproduction process, that is, within the microenvironment, under its direct influence, the formation of the internal infrastructure of innovative entrepreneurship is carried out.

## **DEVELOPMENT.**

The formation of the information economy is a long-term process that includes technological, social, spatial, and other aspects, in addition to the economic component. Analysis of the results of scientific research carried out by domestic and foreign scientists allows us to distinguish the following stages of the transition to the information economy:

1. Informatization of the production sphere. The volume of production of information products at this stage is insignificant. Information technology in industry is used only in certain regions, sectors and economic activities. Information infrastructure is fragmented.
2. Informatization of the infrastructure of innovative entrepreneurship. There is a massive introduction of information technology and standardized information systems in production and in the activities of institutions and organizations of the infrastructure of innovative entrepreneurship. It is the processes of informatization that create conditions for expanding the interaction of subsystems and elements of the infrastructure of innovative entrepreneurship, coordinating this process, bringing the composition of infrastructure support in line with the needs of developing entrepreneurship and generating feedback. Regional asymmetry is observed in the development of the information sector, the need to form an appropriate block of institutional infrastructure is being actualized. Concepts of informatization of state and municipal authorities appear, standard concepts of informatization of activity are developed. There is an acute shortage of highly qualified specialists. The formation and development of the infrastructure of innovative entrepreneurship becomes the most important strategic task of management at the regional level.

3. The information sector is developing at a fast pace. The production of information and communication technologies (ICT) is becoming the dominant economic activity. The number of people employed in the information sector of the economy and industries related to the production and dissemination of information and knowledge exceeds 50% of the total working-age population. E-government appears, most contacts are made via global computer networks. The global ICT market is being formed, where the leading positions today are occupied by the USA, Japan, Germany, Finland, the United Kingdom and others.

4. Formation of an economy based on knowledge, priority R & D and the development of innovative entrepreneurship. The information sector in the economy and entrepreneurship occupies a leading position, products and services are becoming more knowledge intensive. The number of people employed in the information production sector becomes overwhelming. All transactions are carried out electronically, the urgency of the problem of information asymmetry is reduced. The e-government system is fully formed. Today, economically developed countries are only approaching this stage.

One of the key obstacles to the transition to the information economy of Russian Federation is currently the lag in the implementation of infrastructure support for business activities from the needs of business development.

The main aspects of the impact of the transition to the information economy on the theory of the infrastructure of innovative entrepreneurship include the following aspects that require theoretical substantiation:

1. The process of informatization of production activity defines new needs of innovation business entities in infrastructure provision, which are satisfied both at the intra-firm level by improving the production and organizational-management infrastructure, and based on market interaction, participation in innovative entrepreneurship support programs.

2. The processes of formation and development of the infrastructure of the information sector of the regional economy are investigated in the context of the development and implementation of appropriate technical solutions, business virtualization, and the creation of appropriate specialized institutions for the development of innovative entrepreneurship infrastructure.

3. The processes of informatization of subsystems of the infrastructure of innovative entrepreneurship are manifested in the inclusion in their composition of information and communication, information and analytical elements that contribute to the establishment of new links in the system of entrepreneurship.

4. The processes of managing the development of the infrastructure of innovative entrepreneurship are complicated as a result of: the expansion of the infrastructure subsystems of innovative entrepreneurship (the emergence of new types of economic activity, the use of new support tools, the emergence of new institutions); the presence of interregional imbalances in the development of the infrastructure of innovative entrepreneurship; the need for a differentiated development of appropriate functional strategies and management mechanisms.

The transition to an information economy is the basis for overcoming the above control limitations. Its implementation is a long-term process, requiring appropriate resource support and theoretical and methodological substantiation.

Making of management decisions on the development of the infrastructure of innovative entrepreneurship in the process of informatization of the economy is complicated by the emergence of a number of new restrictions, such as: the supply of information products and technologies outpaces the demand for them and the creation of infrastructure to ensure their application; new types and forms of business activity arise in the absence of relevant elements of the institutional infrastructure; as a result, forms of entrepreneurship in the information sector such as hacking, illegal e-commerce, online commercial espionage appear; there is a lag in the development of

infrastructure support tools from the development needs of innovation business entities; the problem of information security at the level of the country, region, business structures is being actualized, reducing its severity requires additional resources.

The listed restrictions of management aggravate information asymmetry at the functional level (in various sectors of the economy), at the regional level (between different regions of the country), at the consumer level (differences in access of citizens to information resources).

At the regional level, in the conditions of the formation of the information economy, the basis for managing the development of the regional infrastructure of innovative entrepreneurship should be the interaction of business and government in the formation and development of infrastructure support for regional innovative entrepreneurship. For the practical implementation of this process, it is necessary to formulate a strategy for the development of a regional infrastructure of innovative entrepreneurship and an appropriate coordination and management mechanism.

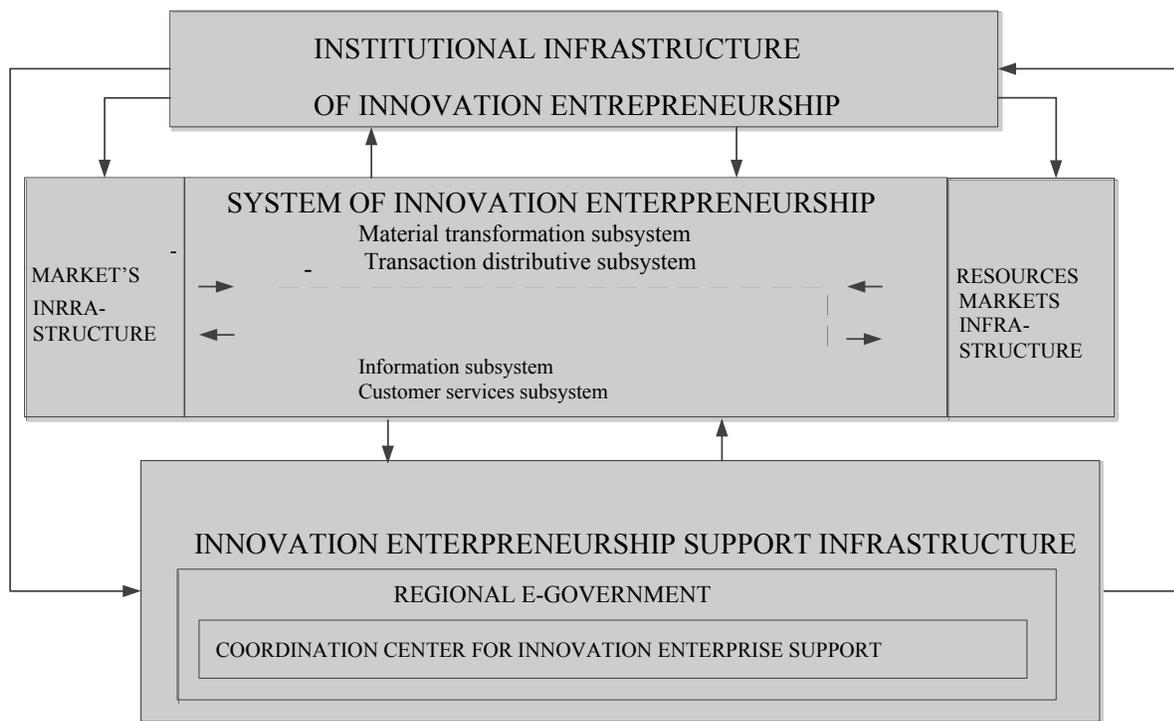
The methodology and theory of entrepreneurship are based on the fundamental works of the Doctor of Economics. Israel Kirzner, American economist Frank Heinemann Knight, Austrian economist, Nobel Prize in economics (1974) Friedrich Hayek, American economist Joseph Schumpeter and other classics of economics.

The theory of the formation and development of the infrastructure of innovative entrepreneurship, which takes into account the specifics of the business system of the Russian Federation, is fragmented in domestic economic science.

The infrastructure of innovative entrepreneurship is a synthetic concept. It can be investigated as a subsystem of the economy and the specific market. It possesses such features in which it acquires the specifics of the infrastructure provision object of the innovative business system.

The composition of the infrastructure of innovative entrepreneurship is heterogeneous. Its formation is carried out within the system of entrepreneurship, where, in the process of interaction of elements, the infrastructures of markets are formed — the internal infrastructure of innovative entrepreneurship and the external infrastructure of innovative entrepreneurship, including the institutional infrastructure to support entrepreneurship - Figure 1.

Figure 1 - The place of infrastructure in the system of innovative entrepreneurship.



As a result, the place of infrastructure in the system of innovative entrepreneurship can be determined as follows:

1. The infrastructure of innovative entrepreneurship in the regional economy system is designed to promote the formation of general conditions for the subjects to achieve their goals, ensuring the integrity of the system itself.
2. In the modern information economy, business infrastructure acquires non-market subsystems. This contributes to the predictability and stability of the market environment and business efficiency.

The study of the conceptual provisions of the theory of the infrastructure of innovative entrepreneurship, the processes of formation and development of infrastructure support for business activities in the information economy allows us to offer the following definition of this concept. The infrastructure of innovative entrepreneurship is a set of institutions, entrepreneurial structures and information and communication technologies that provide general conditions for the reproduction of entrepreneurial type through the formation of an institutional environment, the application of measures to support innovative entrepreneurship, the creation of new organizations and the development of new types of economic activity, according to tasks of information economy.

In this definition, the infrastructure of innovative entrepreneurship is interpreted in a broad sense. It is considered as an aggregate resulting from the synthesis of elements of economic infrastructure and market infrastructure in the field of providing institutional, preferential auxiliary and market conditions for doing business, creating new organizations and developing new types of economic activity that meet the goals of the information economy.

At present, the slow pace of the transition to the information economy in the country is aggravated by the lag in the development of the business infrastructure subsystems.

As part of the institutional infrastructure, the next points are manifested:

- Imperfection of the regulatory framework, developed without taking the possibilities of using information technology into account.
- Insufficient development of information technologies and the unreadiness of state authorities to use them in managing and organizing of interaction with subjects of innovative entrepreneurship.
- Fragmentary nature of the strategic planning of the development of the infrastructure of innovative entrepreneurship.

In the area of support for innovative entrepreneurship, the transition to an information economy is restrained by the lack of developed information support for business structures when entering new markets and the commercialization of innovations.

The formation and development of an infrastructure support system that meets the needs of the development of innovative entrepreneurship requires an appropriate methodological support, determining its composition, functions, relationships and development patterns. Analysis and systematization of the methodological aspects of the formation and development of the infrastructure of innovative entrepreneurship have particular importance for the development of economic science and economic practice in the information economy, the emergence of new forms of entrepreneurship, the improvement of interaction mechanisms of business structures, the creation of specialized development institutions.

Improving the national economy of modern Russia on the basis of innovations is impossible without such specific, interrelated processes as regionalization and informatization of economic entities. The essence of these processes is revealed by the economic relations arising and developing in the regional innovation subsystems in the process of the innovation activity of economic entities. The modern practice of informatization of the innovation subsystem at any level shows that this process goes with great difficulties, this is especially shown at the regional level, which is one of the serious obstacles to the formation of the innovation system of the region as a whole (Khomeenko, 2015).

Information and communication technologies (ICT) allow the integration of scattered technical-economic, organizational-economic and managerial processes occurring in the innovation subsystem. This is especially important in the framework of regional innovation subsystems (RIPs), at the level of which it is more difficult to integrate all processes in line with the optimal regional solution. On the other hand, ICTs open up unlimited possibilities for the interpretation and addition of new modules in the development of optimal ways to solve regional economic problems.

Systematization of different views on the concept of "information" of modern foreign and Russian scientists allowed to reveal and clarify the key points of this category.

“Information” in the general sense is information about the changes taking place in the outside world. The concept of "information" allows you to reveal the economic essence of the regional innovation subsystem as a set of interacting regional actors and institutions that individually and jointly participate in the formation, reproduction, storage and distribution of knowledge, technical developments and skills to ensure stable socio-economic development of the economic subject and improving the quality and standard of living of the population of the region due to:

- Creation of innovative technologies, services and products.
- Formation of jobs in all sectors and areas.
- Increase revenue through the production of national products.
- Raising the level of education of the population of the region.
- Use of new technologies in solving social and environmental problems of an economic entity.

It is possible to distinguish the key elements of the regional innovation subsystem:

- Subsystem of knowledge generation.
- Subsystem of professional training and education.
- The subsystem of services and production.
- Subsystem of innovation infrastructure.

The economic content of information is viewed from different angles: as a result of information of production, as one of the main resources of the innovation subsystem, as an object of sale and purchase, as a public good used by all sectors of society, as part of a market mechanism that contributes to the formation of an equilibrium state of innovation subsystems, as a resource while making management decisions.

It is difficult to estimate the impact of information activities on regional innovation subsystems in the conditions of the interaction of global and regional processes, in conditions where there is a daily increase in the requirements for the content and presentation of knowledge about the prospects and changes in the innovation environment of an economic entity. The essence of this process is the collection, processing, storage, retrieval and distribution of information for the continuous formation and management of an information resource. In this case, the formation and use of effective methods for collecting, processing and applying information in the development of regional innovation subsystems, which form the basis of the management mechanism of information support for regional innovation subsystems, becomes urgent.

The information support mechanism for the development of regional innovation subsystems is a system of relations between the subsystems of regional innovation subsystems for transferring external and internal information about the main parameters of its functioning, its safe and stable development. This mechanism is specified by specific goals, methods and tools, communication channels, transformation of useful and accessible information for the effective functioning of regional innovation subsystems. It also consists of a database management system and parameters designed to analyze the current level of information and communication development, which characterize the state and possible prerequisites of an economic subject in the development of regional innovation subsystems, their degree of openness and dynamism. This mechanism consists of its own content and tools: information and communication technologies (ICT), database management systems (DBMS), databases (DB) and knowledge base, which form information support systems for business entities. ICTs act as the main method of such transformation, the organization's IP is in the form of means, and the result of the functioning of this mechanism is a distributed, integrated and systematized common information space of a business entity (Khasanshin, Shtrikov, 2019).

The development of commodity and resource markets, the emergence of new market niches, the deepening of specialization in the sphere of circulation stimulate the expansion of the range of support services, causing an objective need to create specialized institutions and organizations of market infrastructure, developing new infrastructure types of business activities, identifying areas for improving the infrastructure of innovative entrepreneurship. The internal infrastructure of innovative entrepreneurship implements its functions at the level of markets.

An innovative enterprise as a form of entrepreneurial activity acts as the main element of the national economy at the regional level, in which the direct process of commercialization of the results of scientific and technological progress is carried out. The main system factors of the definition of an innovative enterprise as the main element of the national economy and as an independent economic entity are cooperation based on the internal division of labor, the implementation of individual reproduction functions and the separation of the circulation of capital (resources).

An innovative enterprise as a business entity is a production system: dynamic, since its composition, parameters and elements (the number and their characteristics) change over time; artificial, created by people; open, associated with the external environment; stochastic, since its behavior can be predicted with a certain probability. In a broad sense, production activity is the activity of a person, a collective, a state, aimed at creating new material and other values (Goldshtein, 2003).

The complete system of production activity of an innovative enterprise is called an operating system, which can be characterized as follows:

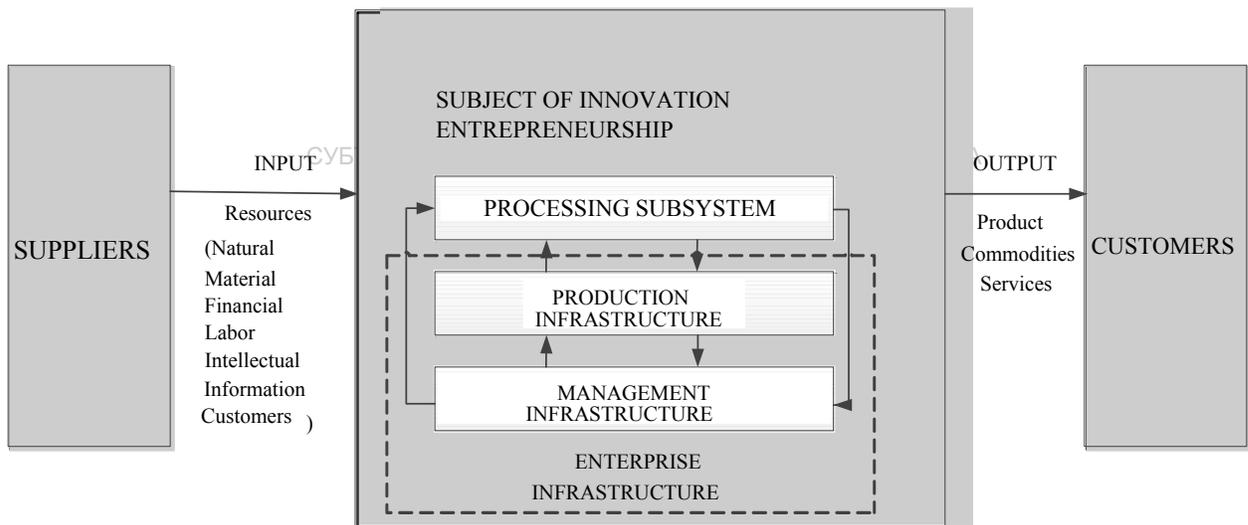
$$S = f(A, B, C, \alpha, \beta, \gamma),$$

where S is the operating system of the innovative enterprise; A - the processing subsystem; B - production infrastructure; C - organizational and management infrastructure;  $\alpha$  - connections

between subsystems and within subsystems;  $\beta$  - system functions;  $\gamma$  - additional restrictions inherent in the system (resource, temporal, spatial).

The cybernetic model of an innovative enterprise as a system includes three elements (Figure 2): a process (production or infrastructure operation); input (resources) and output (product); external environment (external environment in the model is not structured, is considered as a source of production resources and a consumer of goods produced).

Figure 2 - Cybernetic model of an innovative enterprise.



The management entity generates a control action that is transmitted to the object of management, in the form of an order, command and signal. The object of management are the units of an innovative enterprise responsible for the release of an innovative product. These are the structural elements of the system - production, departments, sites, laboratories, groups of performers, forming a processing subsystem, production infrastructure and organizational and management infrastructure; as well as production and infrastructure processes. The management entity learns that the object of management has reacted to the control action, from the information via the feedback channel. The control subject generates new control actions depending on this information.

Thus, modern innovative enterprises are independently functioning economic units whose activities are subject to the laws of entrepreneurship and consist in the constant search for the optimal form of compliance with market requirements at a particular moment of market development.

It is advisable to distinguish between levels of the macro environment, which in addition to the state itself includes the international economy, transnational corporations, mesoeconomic structures (regions, large integrated business groups, natural monopolies) (Shultz, 2011). The impact of these levels of the national economic system on a separate innovative entrepreneurial structure is heterogeneous, therefore, depending on the subject and objectives of a particular study, various factors are taken into account.

Firstly, macro and mesoeconomic agents have a different impact on the subjects of innovative entrepreneurship due to the fact that the interaction with the first is carried out on non-market principles (macroeconomic regulators), and the interaction of microeconomic agents with mesoeconomic ones is carried out on a market and non-market basis.

Secondly, the subjects forming the macroenvironment in their activities have different targets, their interests are often directly opposed.

Thirdly, interaction occurs within the macro-environment, for example, objects of the meso-level are influenced by the macro-regulator, similarly to microeconomic agents.

## **CONCLUSIONS.**

As a result of globalization and the expansion of the presence in the national markets of transnational corporations, a change in relations between the state and innovative entrepreneurship is taking place, big business begins to play an active role in politics, lobbying its interests.

In relation to a separate subject of innovative entrepreneurship, at the meso-level, under the influence of the macro environment, an external infrastructure of innovative entrepreneurship is formed, the influence of which manifests itself in one direction - from the element of the

environment (in our case, the external infrastructure of innovative entrepreneurship) to a specific subject of entrepreneurial activity, institutional infrastructure, supporting infrastructure of entrepreneurship).

The external infrastructure of innovative entrepreneurship is heterogeneous and multi-layered, as is the macro-environment as a whole, and often creates favorable conditions not for the development of innovative activities, but for those who have connections in government structures.

The infrastructure support of a certain type of business activity is formed by the formation of infrastructure bases in the form of the market infrastructure of a given product (resource) as a result of the selection of infrastructure elements within the innovative business system and their interaction with the external infrastructure elements. The process of the formation of the internal infrastructure of innovative entrepreneurship is influenced by a combination of intra-infrastructure factors that are not individually elements of the infrastructure of innovative entrepreneurship, but they provide the conditions for the functioning of individual subjects of innovative entrepreneurship.

Thus, the internal environment of the subject of innovative entrepreneurship can be structured by emphasized the following interconnected and interacting subsystems:

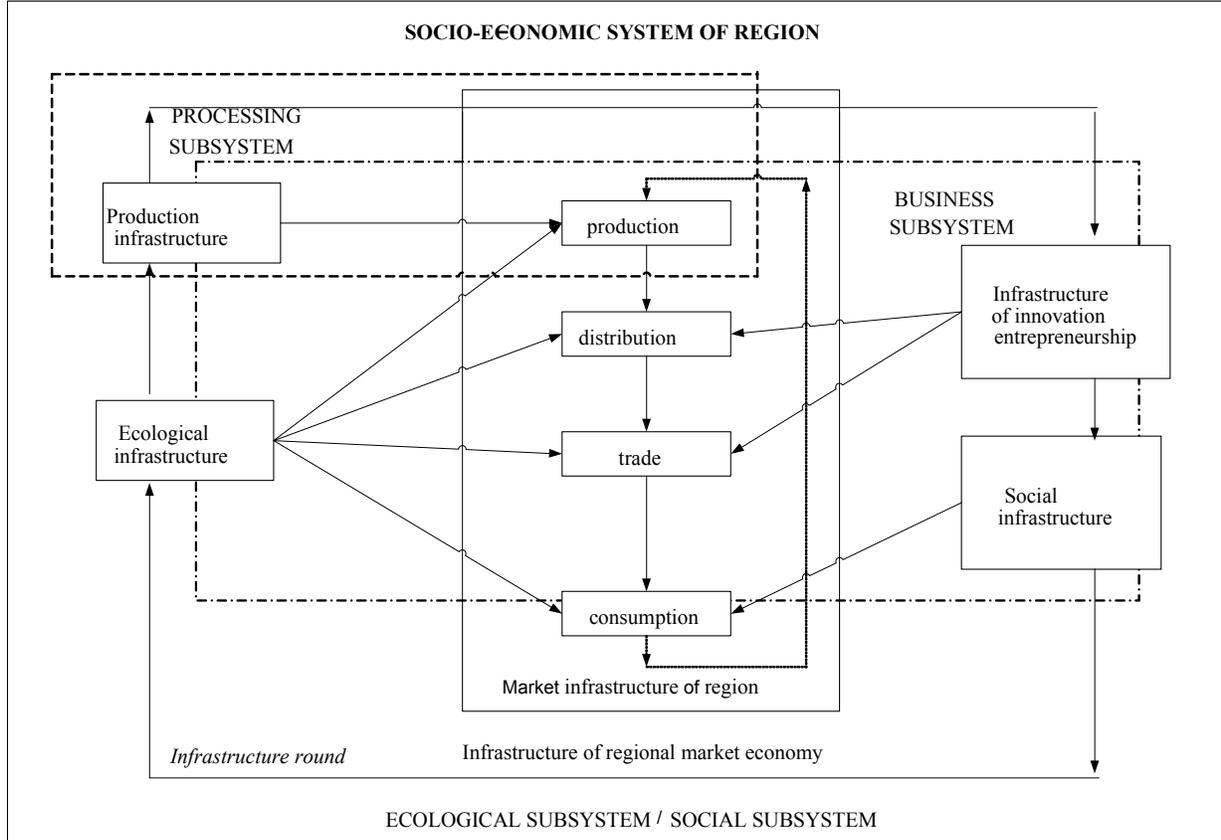
- The processing subsystem carries out production activities directly related to the transformation of the initial resources into a product supplied to the external environment, which can be either consumer or industrial, or infrastructural.
- Production infrastructure - a support subsystem not directly related to the production of a product and its promotion to the market, but performing auxiliary functions, creating general conditions for the functioning of the processing subsystem (manufacturing and repairing tools and equipment, repairing equipment, providing all types of energy).

- The organizational and management infrastructure is a subsystem that helps create the conditions for the efficient distribution of resources and management of their use (finance, marketing, commerce, logistics, R & D, IT, personnel services).

Some activities that are considered infrastructure in one innovative enterprise, may partly be the element of the processing subsystem or production infrastructure in another, financial operations in a commercial bank, marketing research in a marketing agency, research work in a scientific research institute. At the same time, production activity can be viewed not only at the level of a separate innovative enterprise, but also at the level of a region, country, therefore the concept of “production infrastructure” can have different organizational levels of research that interact with elements of the infrastructure of innovative entrepreneurship as part of the infrastructure of a country’s or region’s economy.

In our opinion, the narrow approach to the infrastructure of the market economy of the region makes it possible to emphasize the following subsystems in its composition: production infrastructure, infrastructure of innovative entrepreneurship, social infrastructure, and ecological infrastructure. Infrastructure communications are established between these subsystems of the socio-economic system of the region, forming the infrastructure circle of the market economy infrastructure, where the production infrastructure determines the direction and conditions for the development of the infrastructure of innovative entrepreneurship, the improvement of which allows to raise the level of social infrastructure development. Improving the quality of social infrastructure determines the needs of forming an appropriate composition of the ecological infrastructure, the functioning of which requires the improvement of the production infrastructure (Figure 3).

Figure 3 - Participation of the infrastructure of innovative entrepreneurship in the formation of infrastructure links in the socio-economic system of the region.



In addition to the infrastructure circle, composition of the market economy infrastructure also establishes diagonal connections, mediating the reproduction process by forming a market infrastructure in accordance with the phases of the reproduction cycle. Market infrastructure contributes to the creation of favorable conditions for the implementation of transactions in the economy, ensuring the growth of competitiveness of economic entities and the realization of their economic interests.

At the level of a separate innovative enterprise, the synthesis of production and business subsystems occurs through the formation of infrastructure links with the external environment. The subjects of organizational and management infrastructure systematize the directions of resource allocation by managing their use.

The composition of the organizational and management infrastructure of an innovative enterprise can be classified based on the resource approach.

The organizational and managerial infrastructure of the subject of innovative entrepreneurship is not only intended to create conditions for attracting economic resources of the required quality and quantity, but also to help increase the efficiency of their use in the production process.

The formation of the infrastructure of innovative entrepreneurship in the region, in our opinion, is carried out in the form of a hierarchical system, within which the subsystems of the infrastructure of entrepreneurial structures, interacting with the infrastructure components of the system of innovative entrepreneurship, participate in the creation of a regional pyramid of infrastructure of innovative entrepreneurship.

The result of the formation of the infrastructure hierarchy is the ordering of the implementation of infrastructure functions in the business system, where a number of patterns are observed. As we move from the intra-firm level of infrastructure to the supra-firm, the universality of the infrastructure support is enhanced, and in the opposite direction, its specificity. At each level of the infrastructure hierarchy, the dominant infrastructure functions are emphasized, the implementation of which is aimed at achieving the goal of forming this subsystem. In this case, the supporting function is of key importance regardless of the level of the infrastructure subsystem. In addition, there is continuity in the implementation of infrastructure functions, which is facilitated by their transitional character: the regulatory function dominates both the institutional infrastructure of innovative entrepreneurship and the infrastructure of support for innovative entrepreneurship; stimulating - in the infrastructure of support for innovative entrepreneurship and in the infrastructure of markets; communication - in the infrastructure of markets and intrafirm infrastructure.

The pyramid of the infrastructure of innovative entrepreneurship reflects the interpenetration of subsystems and the interdependence of infrastructure connections both between the levels of the infrastructure of innovative entrepreneurship: “supra-firm - near-firm”, “near-firm - inter-firm”, and in their interaction with the infrastructure units of the innovative enterprise.

It is at the intrafirm level that the planning and implementation of production activities is carried out, the goal, objectives and the potential of its transformation into innovative entrepreneurial activity are determined. Accordingly, the infrastructure link “infrastructure of innovative entrepreneurship - the organizational and management infrastructure of an innovative enterprise - the production infrastructure of an innovative enterprise” is formed.

The production infrastructure at the level of individual innovative enterprises functions in interconnection with the elements and subsystems of the production infrastructure of higher order systems. At the intrafirm level, the industrial and entrepreneurial subsystems of regional economic systems cross through the formation of infrastructure links between them, the result of which is a synergistic effect, shown in the expansion of innovative entrepreneurial activity and the growth of gross regional product.

Thus, at the microeconomic level, the following features of the formation of infrastructure support can be distinguished: the presence of interconnections between the subjects of innovative entrepreneurship and the subsystems of the infrastructure of innovative entrepreneurship, the hierarchy of the formation of infrastructure support and infrastructure functions.

### **Acknowledgments.**

Authors thank and appreciate all experts interviewing education and human resources specialists who helped us with this research.

**The contribution of each author.**

*Conflict of interests.* There is no conflict of interest between the authors.

**BIBLIOGRAPHIC REFERENCES.**

1. Yakovleva, S. I. (2005). Infrastructure Support for Regional Development. St. Petersburg. - St. Petersburg University of Economics and Finance, retrieved August 20, 2019 from <https://www.dissercat.com/content/infrastrukturnoe-obespechenie-regionalnogo-razvitiya>
2. Fedko, V.P. (2000). Infrastructure Support for the Functional Sustainability of Industry. - Rostov on Don: Rostov State Economic University, retrieved August 20, 2019 from <http://www.dissercat.com/content/infrastrukturnoe-obespechenie-funktsionalnoi-ustoichivosti-promyshlennosti-teoriya-i-metodologia>
3. Ivanchenko V., Ivanchenko V. (2007). The Problem of Innovative Reproduction // Ekonomist. No. 2, P. 21-28.
4. Kuchukov R. (2009). The Role of the State in the Formation of an Innovative Economy // Ekonomist. No. 6, P. 4.
5. Golts A. G. (2000). Infrastructure and society: principles of the strategy of advanced development of Russia // Ekonomika Sovremennoy Rossii. No. 2, P. 6.
6. Khomenko, E. B. (2015). Managing the Development of the Infrastructure of Entrepreneurship in the Transition to the Information Economy. - St. Petersburg. St. Petersburg University of Economics and Finance, retrieved August 20, 2019 from <http://www.dslib.net/ekonomika-xoziajstva/upravlenie-razvitiem-infrastruktury-predprinimatelstva-v-usloviyah-perehoda-k.html>.
7. Asaul A.N., Vladimirsky E.A., Gordeev D.A., et al. (2008). Patterns and Trends in the Development of Modern Entrepreneurship. - St. Petersburg: ANO IPEV, retrieved August 20, 2019 from [https://www.aup.ru/books/m213/2\\_4.htm](https://www.aup.ru/books/m213/2_4.htm)

8. Khasanshin I.A., Shtrikov A.B. (2019). Desarrollo de soporte informativo para el sistema nacional de emprendimiento innovador. Revista Dilemas Contemporáneos: Educación, Política y Valores. Año: VI, Número: Edición Especial, Artículo no.:32, Período: Julio, 2019.  
[https://dilemascontemporaneoseduccionpoliticayvalores.com/\\_files/200005366-de04ddef7/EE%2019.07.32%20Desarrollo%20de%20soporte%20informativo%20para%20el%20sistema%20nacional%20de....pdf](https://dilemascontemporaneoseduccionpoliticayvalores.com/_files/200005366-de04ddef7/EE%2019.07.32%20Desarrollo%20de%20soporte%20informativo%20para%20el%20sistema%20nacional%20de....pdf)
9. Goldshtein G. Ya. (2003). Basics of management: study guide / ed. 2nd, supplemented and revised. - Taganrog: Publishing house of TSURE, retrieved August 21, 2019 from [http://www.aup.ru/books/m77/1\\_2.htm](http://www.aup.ru/books/m77/1_2.htm).
10. Shultz D. N. (2011). The interaction of the company and the state in a new economy: a hierarchical approach // Zhurnal Ekonomicheskoy Teorii (Journal of Economic Theory. No. 1, P. 57.

#### **DATA OF THE AUTHORS.**

1. **Ildar Anvarovich Khasanshin.** PhD in Economics, Associate Professor, Department of Digital Economy, Povolzhskiy State University of Telecommunications and Informatics, Samara, Russia.
2. **Alexander Borisovich Shtrikov.** PhD in Economics, Associate Professor, Department of Personnel Management, Samara State University of Economics, Samara, Russia, [ashtrikov@yandex.ru](mailto:ashtrikov@yandex.ru)

**RECIBIDO:** 9 de septiembre del 2019.

**APROBADO:** 19 de septiembre del 2019.