

Innovative Business Model of the Cluster as an Ecosystem

NATALYA MASYUK¹,

Vladivostok State University of Economics and Service, Vladivostok, Russia

MARINA BUSHUEVA,

Russian University of Economics by

GV Plekhanov (Ivanovo Branch), Ivanovo, Russia

ZINAIDA BRAGINA

International Academy of Business and New Technologies (MUBINT), Yaroslavl, Russia

Abstract. Business modeling is an innovative form of representation of inter-firm interactions of enterprises and organizations, united by formal and informal economic relations. The business model is a graphic illustration of the structure of these relations, helping to understand their logic and complexity in the context of globalization. Networking and clustering are the responses to the global challenges of the external environment. In these conditions, new variants of an interaction of economic agents arise in conditions of uncertainty and risk. The most common form of intrafirm interaction in the conditions of one territory is clustering, which, as practice shows, have network structures. In our opinion, the purpose of the regional cluster as a network is to implement the key competencies of the territory and improve the quality of the economic situation in the region by improving the business climate of the environment. There are many efforts of scientists and business practitioners to design and make configurations for illustration of the cluster's relations and interactions. The article describes the configuration of the cluster business model in its interpretation as an innovative network ecosystem. Theoretical views about the cluster were extended in the direction of the configuration of its business model and the definition of its main structural elements. Particular attention is paid to the partnership interaction of the main groups of economic agents in the cluster, which include: key business structures, key educational organizations, key research organizations, and the state.

Keywords: cluster, network, innovative ecosystem, business model, configuration, business climate, key competencies, partnership, regional development.

Introduction. Until recently, clusters were considered autonomously as a kind of independent economic phenomenon. However, studies of economists of the last decade make some adjustments to this point of view. Many researchers come to the opinion of the network character of regional clusters (Hamdouch, 2007). Adapting to the new paradigm, regional innovative economic systems are moving to a cluster structure with a predominance of network inter-firm and inter-organizational

¹ Corresponding author Natalya Masyuk: masyukn@gmail.com

interactions. It can be stated that most of the regions that gravitate toward clustering enter the era of cluster-network interaction.

One of the first author who has demonstrated interest into the network structures was Manuel Castells (Castells, 1996) in the context of the formation of a post-industrial society. In his opinion, the main feature of the information society is the network logic of information use. At the same time, hierarchical systems gave way to a network method of coordinating links consisting of network information flows, network structures and network interactions (Mattsson, 1987). The authors Bragina, Irodov, & Maslova (2016) argue reasonably that network interactions ultimately inevitably lead to the formation of a networked economy. Of interest is the work of Romanova & Lavrikova, in which the thesis was expressed that «... network is a promising form of functioning of the regional economy, and clusters are tools for creating this form» (Romanova & Lavrikova, 2007).

The development of business modeling allows us to take a fresh look at the phenomenon of regional clusters. The tendencies of networking and clustering are traced in the development of regional economic systems not only on the territory of the Asia-Pacific Region, but also practically in all territories of developed modern states (Startsev & Davankov, 2011; Smorodinskaya, 2012; Masyuk, Kazantseva & Bushueva, 2015). Business modeling is a modern innovative tool for representing regional economic systems developing in the face of global changes in the external environment (Zagoruiko, Masyuk, & Perfilieva, 2015). The scientific problem is that, on the one hand, science knows a lot of attempts to graphically depict the spatially organized territorial systems to which the cluster belongs, on the other - none of them explains the patterns of their development and functioning. The use of analogues with biological systems of wildlife sharply changes the idea of clusters (Capra, 2003). Carga believes that any socio-economic systems have many similarities with biological systems, since both are “living”, mobile, constantly changing systems with many internal connections. Agreeing with this opinion, based on this perspective, we will begin to build a cluster business model as a network ecosystem.

Proceeding from this send, we will proceed to build a business model of the cluster as a network ecosystem.

Method and Methodology. If we consider the integration of economic entities into a cluster in an evolutionary context, then it can be noted that the models of innovation activity of actors participating in the cluster change over time, because each of them, through various devices, exchanges information with many other partners and simultaneously belongs to another or several networks.

Therefore, this study takes the view that the cluster for the above reasons can be represented as a network ecosystem - a kind of «living» organism that, in order to ensure the ultimate effect of its existence and destination, goes through all stages from creation and development to stagnation. The term «ecosystem» for describing

the cluster is also used in the context of the description of the evolution of the interactions of all its basic elements (Smorodinskaya, 2012).

Before proceeding to the description of the proposed business model of the cluster, we note that the founder of business modeling in its current form is rightly considered to be the Osterwalder and his followers (Osterwalder, Pigneur & Tucci, 2005). Chesbrough made a great contribution to the development of business modeling (Chesbrough & Rosenbloom, 2002).

Turning to the living" biosystems, we can see that they all have a complete cycle, passing through all the stages of growth and development from roots to flowers. According to the authors, the cluster as a socio-economic system should also be presented as a living" organism, which, in order to ensure a guaranteed final effect, must pass through all stages of growth and development. Investigations of key elements of regional systems made it possible to depict the cluster as a biological system or a "business ecosystem" explaining all the structural relationships in the cluster.

Until recently, clusters were considered autonomously as a kind of independent economic phenomenon. However, studies of economists of the last decade make some adjustments to this point of view. Many researchers come to the opinion of the network character of regional clusters. Adapting to the new paradigm, regional innovative economic systems are moving to a cluster structure with a predominance of network inter-firm and inter-organizational interactions. It can be stated that most of the regions that gravitate toward clustering enter the era of cluster-network interaction.

One of the manifestations of networking is the emergence of associative holdings, based on the virtual interaction of actors. Such economic categories as mutual trust of partners, a balance of mutual interests, etc. come to the forefront. As early as the end of the twentieth century, Reiss M. predicted a great future for network organizations. Some researchers emphasize entrepreneurial networks and clusters among a variety of network structures, noting the similarities in terms of their management (Raiss, 1997).

Before proceeding to the consideration of the business model of the cluster, let us define the concept of "ecosystem", which is borrowed from biology. In the economic context, this term is usually used and is viewed as a concept that describes the evolution of the character of interactions of economic agents, models of their innovation activity and their relationship with the environment of functioning

According to Smorodinskaya N.V., at the meso- level, a typical ecosystem of network links that determines the model of the organization of the modern economy from the point of view of the recruitment of its productive sectors, are the trans-sectoral clusters that have their own specialization and territorial localization (Smorodinskaya, 2014).

Results. Now let's look at the configuration of the cluster business model. Attempts to depict the cluster graphically at different times were undertaken by different scientists. For a long time, none of the graphic images was consistent with

the proposed philosophy of clusters. Turning to the "living" biosystems, you can see that they all have a complete cycle, passing through all the stages of growth and development from roots to flowers. According to the authors, the cluster as a socio-economic system should also be presented as a "living" organism, which, in order to ensure a guaranteed final effect, must pass through all stages of growth and development (Bushueva, Masyuk & Bragina, 2017).

In our opinion, the treatment of a cluster as an ecosystem deserves special attention and allows one to resort to an unconventional form of representing a business model of a cluster in the form of, for example, a flower. The image of a cluster in the form of a flower with leaves and roots not only reflects its structure, but also reflects the logic of the interrelations of its structural elements, as well as the principles of interaction of all subjects within the cluster. The main of these principles is interdependence. "All members of the ecological community are interconnected through a vast and complex network of relationships, the web of life. They acquire their vital properties and, in fact, their very existence through relationships with other objects. Interdependence - the mutual dependence of all life processes from each other - lies in the nature of any ecological relationships. The behavior of each living member of the ecosystem depends on the behavior of many others. The success of the entire community depends on the success of its individual members, just as the success of each member depends on the success of society as a whole. «Understanding ecological interdependence means understanding relationships. Therefore, it was this configuration of the business model of the cluster that we accepted as the basis for this research (Masyuk, Bushueva, Bragina & Petrukhin, 2017).

Analyzing the proposed configuration of the business model of the cluster (Fig. 1), it should be noted that the partnership between the four leading groups of economic agents-the institutional sectors of the cluster-key business structures, key educational organizations, key research centers and the state, placed in petals of a flower, by analogy with the «triple helix» of Etzkowitz-Leydesdorff (Etzkowitz & Leydesdorff, 1998). The core of the flower - the business core - is an innovative cluster-forming products and services.

The territorial basis of the cluster as an ecosystem is the link to its territory (following the classical definition of M. Porter) with its industrial orientation, infrastructure, geographical location, campuses, platforms for cooperation, etc.

In the root of the root system, on which growth and development depends, are placed the ideas and talents of people, human capital. Here also are all possible sources of funding: venture funds, business angels, direct investment funds, seed investors, etc.

The most important assets of the cluster are Clients, which can be attracted at the early stages of innovative solutions, as well as specialized suppliers of raw materials.

Considering a cluster as an ecosystem, one cannot help noticing that all the elements that make up its structure interact not only with each other, but also are involved in horizontal (network) interactions. And, for example, any university can become a participant in an educational alliance based on network relations;

business structures are united in entrepreneurial networks; scientific research organizations form their networked scientific communities; banks, insurance companies and various credit institutions are also participants in various networks. However, this does not prevent them from fulfilling their direct role in the cluster. The network nature of the cluster gets its most complete embodiment; it begins to function most fully in this environment. Being in a cluster, economic agents in certain cases can make mutual concessions (local trade-offs) and financial losses to maintain their positions in the long term. But for this, business partners must absolutely trust each other.

All of the above allows us to state the competence of the cluster representation in the form of a network innovation ecosystem. At the same time, in our opinion, the innovation of the cluster should be ensured not by the enterprises included in it, but by the cluster-forming types of products and services that make up the business core of the cluster.

Discussions. Evolutionary processes occurring in nature and society affect also socio-economic systems, including clusters. Therefore, it is competent to consider clusters as ecosystems. Business entities participating in the cluster are connected by horizontal network interactions with a multitude of non-cluster agents, so clusters can be considered network ecosystems, and innovation is given to these systems by innovative cluster-forming products and services. The configuration of the business model of the cluster in the understanding of its essence as an ecosystem can be the appearance of a plant, in our case, a four-leaf flower. Regional clusters tend to the territory on which they are located, and "absorb" all its advantages and disadvantages. The purpose of the regional cluster as a network, in our opinion, is to realize the key competencies and potential of the territory and improve the quality of the economic situation in the region by improving the business environment.

Further studies of the business model of a regional cluster as an innovative network ecosystem should be carried out in the direction of studying the economic mechanisms for replenishing the missing resources and competencies of the territory not only through direct partners in the cluster, but also at the expense of network actors located in the second network ring of the geographical limits of the regional cluster. The logic of reasoning about the possibility of using examples of living nature to characterize inanimate objects has led us to the fact that, since a cluster can be regarded as an innovative network ecosystem, the configuration of a plant (tree or flower) can be used for its graphic representation, in our case it is a flower.

Conclusion.

In the work theoretical concepts about a configuration of business models of clusters in a direction of their image as some element of animate nature, in our case - a flower-four leaf are expanded. In this case, a meaningful explanation is given to all the key elements included in the business model. The main elements (blocks) of the business model of the cluster are "key business structures", "key educational

organizations", "key research centers", "customers", "key suppliers", "territory" and "key sources of financing ". The increment of scientific knowledge on the subject matter in question is the proposed configuration of the cluster business model in the understanding of its essence as an ecosystem depicted as one of the elements of living nature, namely, the four-leaf flower. Further research, in our opinion, should be carried out in the direction of developing a configuration of entrepreneurial networks, which are similar in many respects to clusters, but also have their differences.

References

1. Bragina, Z., Kiselev, I., & Morozov, I. (2016). Methodical approach to the study of co-evolution of the socio-economic development of the region. *Regional economy and management: electronic scientific journal*, 4 (48), 284-294.
2. Bragina, Z.V., Irodov, M.I., & Maslova, A.V. (2016). *From network interactions to a networked economy*. Russia, Yaroslavl: International Academy of Business and New Technologies (MUBINT). 124 p.
3. Bushueva, M., Masyuk, N., & Karantseva, A. (2015). Cluster-network paradigm in the management of the region's economy. *Vector of science TSU: Economics and Management*, 4 (23), 15-18.
4. Bushueva, M., Masyuk, N., & Bragina, Z.V. (2017). Conceptual Bases for the Construction of the Business - Model of a Regional Cluster as an Innovative Ecosystem. *Azimuth of Scientific Research: Economics and Administration*, V.8, 2(19), 39-42.
5. Capra, F. (2003). *The web of life. A new scientific understanding of living systems*. Trans. with English. Ed. V.G. Trilisa. C.: «Sofia»; Moscow: Publishing house «Sophia». 336 p.
6. Castells, M. (1996). *The Rise of the Network Society*, Volume 1, Oxford: Blackwell, 556p.
7. Chesbrough H., & Rosenbloom R. (2002). The role of the business model in capturing value from innovation: evidence from Xerox Corporation's technology spin-off companies. *Industrial and Corporate Change. Issue 11(3)*, 529-555.
8. Etzkowitz, H. & Leydesdorff, L. (1998). The Endless Transition: A «Triple Helix» of University-Industry-Government Relations. *Minerva 36(8)*, 203–208.
9. Hamdouch, A. (2007). Innovation Clusters and Networks: A Critical Review of the Recent Literature // *19th EAEPE Conference. Porto, Portugal*.
10. Mattsson, L. G. (1987). Management of Strategic Change in a «Markets-As-Networks» Perspective. *In the Management of Strategic Change/ Ed. by Andrew M. Pettigrew*, Oxford, N. Y.
11. Masyuk, N.N., Bushueva, M.A., Bragina, Z.V., & Petrukhin, A.B. (2017). Presentation of the business model of a textile cluster as an innovative network ecosystem. *Izvestiya Vuzov. Technology of the textile industry*. 1, 10-17.

12. Masyuk, N., Karantseva, A., & Bushueva M. (2015). The Far East of Russia: synergy of clusters and territories of advanced socio-economic development. *Scientific review*,13, 182-187.
13. Osterwalder, A., Pigneur, Y., & Tucci, C. (2005) Clarifying business models: origins, present and future of concept. *Communications of the Association for Information Systems*.
14. Perru, F. (2007). Economic Space: Theory and Applications. *Spatial Economics. Issue*, 2,77-93.
15. Raiss, M. (1997). Borders of «boundless» enterprises: the prospects of network organizations. *Problems of theory and practice of management*. 1, 92-97.
16. Romanova, O.A. & Lavrikova, Y. (2007). Cluster development of the region's economy: theoretical possibilities and practical experience. *The Economy of the Region*. 4 (Appendix), 40-51.
17. Smorodinskaya, N. (2012). Changing the Paradigm of World Development and the Formation of a Network Economy. *Economic Sociology*,13, 4,.95-115.
18. Smorodinskaya, N. (2014). Network innovative ecosystems and their role in the dynamization of economic growth // *Innovations*. 2014. Issue 7 (189). Pp. 27-33.
- 19 Startsev, Y., & Davankov, A. (2011). Networks and clusters - the formation of modern approaches to regional development. *Bulletin of the Chelyabinsk State University: Economy*,35, 110-116.
20. Zagoruiko, M., Masyuk, N., & Perfilieva, O. (2015). The strategy of choosing the business model of the organization and the methodology for assessing the degree of internationalization of the company. *Scientific Review*, 15. 419-423.