MANAGEMENT OF THE INDUSTRY’S INNOVATIVE DEVELOPMENT IN THE EUROPEAN UNION BASED ON CLUSTER INFRASTRUCTURE FORMATION

Relevance of the research. Effective innovative development of industry in the EU is provided through support for inter-industry contacts within the cluster organizations.

Target setting. Due to deep cooperation between domestic and European business, there is a practical need for the development of the cluster concept of the national economy on the basis of European experience.

Actual scientific researches and issues analysis. The problems of cluster networking companies actively studied in western and domestic economic science.

Uninvestigated parts of general matters defining. However, missing are studies that have analyzed the types of clustered services and analyzed the prospects for their development. It should be noted that the establishment of the necessary infrastructure cluster is the basis of effective cluster cooperation that promotes competitiveness at all levels. The research objective. The article is the study and analysis of approaches to design and implement different types of cluster services provided by the cluster services in the European Union.

The statement of basic materials. The authors summarized practical experience of European cluster services in an organization such as market research, mediation in finding partners, project support, organization of technology transfer and support in obtaining financing. We demonstrate the role of these services in enhancing inter-sectoral innovation cooperation network participants.

Conclusions. Cluster organizations provide the appropriate enabling environment for the development of advanced technologies and new business models, acting as “kickers” to attract companies and research institutions from different sectors and countries to jointly develop innovative solutions. They also facilitate the access of SMEs to global value chain and facilitate their participation in long-term cooperation with strategic partners from other countries.

Keywords: cluster companies; cluster infrastructure; cluster services; intersectoral collaboration; the European Union.

Articulation of issue. In today’s economic environment, various forms of business networks are becoming increasingly popular. They are formed and operate on the basis of preserving the legal
autonomy of the individuals, but at the same time with the voluntary coordination of economic activities and cooperation in various fields. The most common and formalized networks in the developed countries are business clusters. Their activities and development are actively regulated by the state policy, at the level of both national and regional governments, and through sectoral and cross-sectoral organizations.

**Problem definition.** In Ukraine, the formation of clusters has not acquired a sufficient dynamism, although there is a business interest in the cluster idea and even the organization of about two dozen clusters in various fields has been recorded. The vast majority of them is formal and does not provide real economic cooperation. But given the interest of entrepreneurs in the cluster form of business and taking into account the deepening of cooperation of national enterprises with the European business, there is a practical need for the development of the cluster concept of the national economy on the basis of the European experience.

**Analysis of recent research and publications.** The problems of the development of business cluster networks are actively studied in the western and national economic science. The essence, types, goals, motives and mechanisms of network structures have been thoroughly analyzed in the scientific writings of such scholars as M. Porter [1], M. Enright [2], J. Solveil, H. Lindqvist, C. Ketels [3], M. Voyarenko [4], O. Karpenko [5], V. Tarasenko [6], S. Sokolenko [7] and others. The issues of the formation stages of cluster networks, the mechanisms of interaction between the members, identifying cluster effects, and the development of approaches to the state regulation of cluster structures have been deeply worked out in their research.

**Uninvestigated parts of general matters defining.** Based on the analysis of scientific sources, it can be stated that today the problems of forming and supporting the cluster infrastructure are left without due attention, especially of the national scientists. There are no studies where the types of cluster services would be examined and the prospects for their development would be analyzed. It should be noted that the creation of the necessary cluster infrastructure is the basis of the effective cluster cooperation that promotes the competitiveness of the participating companies, regions and the state as a whole. Therefore, it seems appropriate to research and implement the EU experience in the formation of the cluster infrastructure and cluster services into the practice of the national enterprises.

**The article goals.** The aim of the presented paper is to study and analyze the approaches to the development and implementation of various types of cluster services provided by cluster organizations in the European Union. To achieve the specific purpose, the following tasks have been set: to summarize the practical experience of European cluster organizations in organizing services for the members of clusters to enhance inter-sectoral innovation cooperation; find out the possibilities of implementing the European experience into the practice of the national enterprises.

**The main part.** The European developers of the cluster policy now focuses on the value-added chains, emerging on the intersectoral basis. Managers and public administrators are aware of the fact that clusters are important tools to promote innovation, as they are a kind of "eco-systems" that provide a favourable business environment for experimentation with new business solutions. The emergence of new industries is difficult to predict but it is possible to support the creation of the necessary conditions for the emergence of innovative breakthroughs that could become the basis of new industries. These conditions are formed and supported within the European cluster networks by means of a variety of cluster services and tools designed to facilitate the intersectoral collaboration of companies. The European Cluster Observatory has identified the portfolio of services that can provide the most promising support to the development of new value-added chains and new industries based on innovation (Fig. 1).

In practice, the services provided by the cluster organizations are not always possible to classify clearly, referring them to certain categories because they are situational and defined by the needs of participants. Therefore, the scheme is the most generalized.

The first step in the implementation of cluster services portfolio to establish intersectoral cooperation is the provision of market research services and identification of the opportunities to create new products on the intersectoral basis. Their professional realization is the key to a successful development of new market segments, both for the existing products and for new ones that only emerge in
connection with the new needs of the society and the industry. These services are particularly valuable for SMEs that do not have the resources to fund the unit, which would be involved in the strategic analysis and market development. Road mapping is quite a common form of the market research.

An example of emergence and successful implementation of internetwork and intersectoral cooperation based on the market research and roadmapping development is a German food cluster foodRegio and a Swedish industrial network of organizations Packbridge. The management of foodRegio cluster for identifying the most promising areas of intersectoral cooperation related to food production conducted the market survey using roadmapping.

The studies have shown that the most promising area is cooperation in the development of smart-food packaging. The partners for cooperation have been found outside Germany.

Due to the set of its competences, a Swedish network Pack bridge has appeared to be the best partner. The interbranch and cross-border cooperation between the two clusters led to many significant innovations and allowed foodRegio to create their own competence in smart packaging. The reason for the success of this strategy is that cooperation was based on clear innovation objectives and specific needs. The logic of the market analysis services is presented in Figure 2.

**Fig. 1. Services of cluster organizations to develop intersectoral innovative cooperation of the participants**

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Intermediary services in partner searching can be considered as a key part of the service portfolio of cluster organizations operating in the EU. Regular events or seminars, business networking missions or visits are typical tools. A good example of non-standard intermediary services in partner searching is Bavarian cluster activity based in Augsburg. Considering that environmental technologies are important for all industrial sectors of the economy, cluster management has introduced a new format to create intersectorial collaboration. Intermediary services in partner searching provide motivation for cluster members to establish contacts with representatives of other sectors including biotechnology and manufacturing sensors, mechatronics and automation, forestry and wood industry, food industry. As a result, the prerequisites for developing interdisciplinary and intersectorial innovative ideas that may have commercial potential are created.

Another important instrument of cluster service is a map of competencies, which is a tool that allows companies and research organizations to identify innovative, cross-industry business solutions. European experts say that many companies present themselves as producers of certain products, rather than to represent the skills and resources they have in dealing with certain problems. The aim of cluster organizations in the development of the mentioned instrument is the identification and description of structured company competencies that are clear for potential customers from other industries and can complete their competencies that are missing but necessary for the development of new markets.

Cluster cooperation can also be supported through technology of intersectorial round tables that promote the association of clients, researchers and companies to assist businesses in developing new technologies and services. Topics of round tables correlate with strategic priorities defined by cluster organization, together with cluster members.

Market research and mediation in intersectorial innovations generate lots of ideas; each can turn into a project. The implementation of ideas into projects is one of the most difficult tasks, because it requires a lot of effort to structure them in a clear program of action, pursuing a specific goal. Projects development can occur through creation of innovative platforms and dialogue with competitors. The example of such services is CLEAN - Connecting Danish Cleantech cluster. It is developed as a model of system innovations to solve complex environmental problems. The model aims to encourage subjects throughout the value chain to develop innovative environmental solutions. The purpose of
The CLEAN innovation model is the implementation of specific ways to solve particular issues and simultaneously promote innovations, open new business opportunities and strengthen competence. Each of the stages in the CLEAN innovation model are presented in Figure 3.

**Fig. 3. Cluster services in the innovative model of cluster CLEAN formation**

An important tool to facilitate intersectorial collaboration in European clusters are special interest groups that are focused on specific topics within the cluster subnet involving interested companies and R & D organizations. The focus of these initiatives is the creation of joint projects with the involvement of all partners that provide the necessary technology, joint marketing, public relations, and lobbying of specific areas in order to be able to further develop specific thematic direction.

Implementation of the project results after its completion or even in the process of its implementation is often a problem, particularly for small and medium businesses. Therefore, technology transfer is a key issue for cluster organizations. Projects are not limited by R & D, cluster focuses on technology transfer. Permanent initiation of technologies transfer enables companies to have access to the methods, processes and tools that have been developed. The goal is to educate interested companies to apply this knowledge and maintain cooperation with regional research institutes. The two main tools for technology transfer are knowledge exchange groups and focused projects of transfer. This is accomplished by designing communication events where interested manufacturing companies represent technological platforms and bring innovative ideas to projects in the field of transfer. The knowledge exchange in groups according intersectorial project helps to maintain a continuous exchange between the research and business communities. This is complemented by workshops, which provide a deeper understanding of different technologies using possibilities. Concepts for projects in transfer are developed during individual consultations with companies. After testing the programs are developed and implemented in cooperation with the above mentioned partners.

In the European Union there are many funding programs undertaken by public institutions and which can be used by cluster organizations or cluster members to support and launch their initiatives. But also there are cluster organizations that created their own programs, for example through innovative financing by vouchers. Their idea is to encourage businesses to seek new knowledge outside their network by providing the unknown funding (within 500-7000 euros) for different purposes. An example...
of providing this type of services is a cluster IN2LifeSciences, which supports SMEs in eight regions of Europe in the following areas:

- organizing meetings and communications: up to 500 euros to cover travel and meetings with relevant organizations in other regions;
- personnel exchange, getting training, recruiting experts by contract to consult on markets, technology, intellectual property issues, etc.: 4,000 euros;
- cooperation on innovative product or service: 7000 euros.

**Conclusions.** In recent years, there is an increase in strategic cooperation of companies, both within the same industry as well as the completely different one in EU countries. Facing the growing international competitive pressures, European manufacturers have realized that to enter new markets, it is necessary to create new value chains for products, services and processes. Their development requires cooperation and integration of innovative subjects from different industries. Cluster organizations provide the appropriate enabling environment for the development of advanced technologies and new business models, acting as "kickers" to attract companies and research institutions from different sectors and countries to jointly develop innovative solutions. They also facilitate the access of SMEs to global value chain and facilitate their participation in long-term cooperation with strategic partners from other countries.

It should be noted that most of the above mentioned cluster services and tools with which they are implemented, can be used in Ukrainian enterprises operation as domestic experts and academic environment has experts with relevant knowledge and skills for their application. The problem of using the above mentioned cluster services in domestic practice, especially SMEs, is more related to the lack of necessity awareness of innovation cluster cooperation, both at the level of individual business entities and state and regional authorities. Providing targeted information, advice and financial state support in the formation of cluster networks and infrastructure could significantly improve the situation and create incentives for domestic companies to develop that direction.

**References**


**Література**

Management of the industry’s innovative development in the European Union based on cluster infrastructure formation