

THE ROLE OF CLUSTERS IN THE DEVELOPMENT OF INNOVATION IN THE TSL INDUSTRY

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Abstract: Innovation is regarded as one of the main sources of competitive advantage in the market. However, in spite of these tendencies, Polish companies are still considered to be too little innovative for other European countries or for the world. Companies in the TSL industry (transport-forwarding-logistic) are also in the trend. About their innovativeness speaks little, but at the same time available data show that the industry is not very innovative. One approach that is mentioned as a solution that can help reduce the barriers to innovation in the TSL industry is to work with other companies. This cooperation can take different forms. Cluster structures are also mentioned. Clusters include, inter alia, the possibilities of knowledge transfer, technology transfer, achieving synergy effect and, as a consequence, the joint development of innovation. Referring to the presented problem of innovation, its low level, especially considering the TSL industry and cooperation aimed at creating new solutions as the aim of the article, is to show the role of clusters as a chosen form of cooperation between enterprises in creating innovations in the TSL industry.

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1. INTRODUCTION

The necessity to implement various innovative solutions applies to any business entity, regardless of the industry or region of its activity. This is related mainly to the growing customer demand, the desire to improve service levels, globalisation, strong competition, elimination of all forms of so-called "waste". All those activities are supposed to lead to greater efficiency and cost savings. At the same time, many reports note that Polish economy is still not very innovative when compared to other countries. The problem of creating innovation in service sectors, in which the percentage of innovative enterprises is lower than that of industrial enterprises, is particularly visible. Moreover, the transport and logistics industry, which is considered to be developmental and characterised by significant innovative potential, is part of a relatively low level of innovation (Przybylska, Kruczek & Żebrucki, 2016, pp. 421–434). Taking into account problems related to the development of enterprise innovativeness, we are looking for factors both inhibiting and activating innovative actions. Among them, a great deal is attributed to cooperation, which takes on various forms in practice. One of them is clusters, including logistic clusters.

In reference to the presented problem of innovation and its low level, especially in the TSL industry, as well as cooperation aimed at creating new solutions, the aim of the article is to point out the role of clusters as a chosen form of enterprise cooperation in creating innovation of the TSL industry.

2. THE CONCEPT OF A LOGISTICS CLUSTER

In the functioning of enterprises of the TSL industry, innovative solutions are playing a significant role. At the same time, for the sake of their development, the TSL industry undertakes various forms of cooperation, including clustering. The concept of a cluster itself was spread by M.E. Porter. Literature extensively discusses the essence, development or objectives of clusters functioning in the economy. On the other hand, less attention is focused on logistic clusters. One defines it as a group of manufacturing and service enterprises whose employees perform logistic functions (Elsner, 2010, pp. 1–33). The core of functioning of logistics clusters is defined as activities performed by joint ventures which individual entities would not be able to implement or would perform them at very low levels. It is also about finding opportunities and partners for creating added value for the client and benefiting from each and every stakeholder in the cluster initiative (Petersson & Södgren, 2014, pp. 3–4). In addition to the advantages often referred to as the benefits of cluster initiatives linked to increased economic efficiency or regional development, the available literature also draws attention to sustainable development that would not be possible within the traditional

functional schemes of the market (Elsner, 2010, pp. 2–3). Y. Sheffi emphasises that clusters develop through "positive feedback" (2013, pp. 465–466). Introduction of companies into a cluster results in an increased number of suppliers and customers, making the cluster more attractive. Simultaneously, that fact increases the ability of the cluster to influence state entities by gaining benefits, for example, for infrastructure investments or legal provisions, attracting even more companies. M. Zeinalnezhad (2011, p. 77) emphasises that clusters can be defined as a grouping of companies belonging to one sector, in the case of logistics clusters, this will be the TSL sector. J. Stanienda (2014, p. 193) among the characteristics of clusters, which can be attributed also to logistic activity, indicate:

- geographic and sectoral concentration of entities in the cluster;
- strong and permanent relationships between entities that may take different forms;
- specialization (division of labor and competencies in the cluster, exchange of resources);
- simultaneous competition and cooperation;
- common direction of development.

Taking into account the features mentioned above, J. Stachowicz and the research team as a cluster treat the beam of four main components as shown in Figure 1.

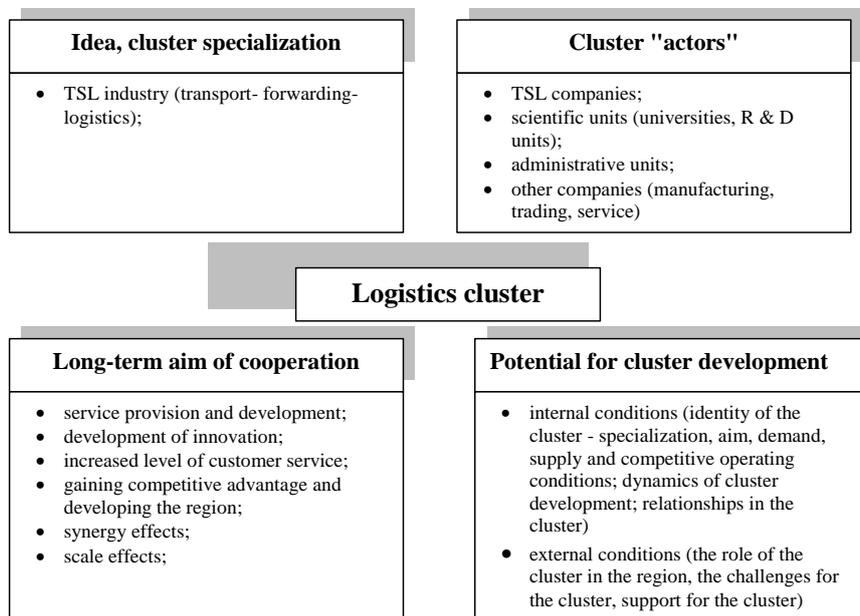


Fig. 1. Main elements of the logistics cluster; source: own elaboration based (Stachowicz et al., 2011, pp. 14–16)

M. Kramarz (2015, p. 87), referring to clustering as one of the types of networks, indicates that, in the case of a logistic network of peer partners, partners cooperate on the same basis, while no organisation has a dominant position with respect to the other participants. Such networks may be organised, for example, in a form of a logistics cluster. The network character of clusters is also emphasised by E. Dobrzyńska (2011, p. 48), describing them as a network of companies with a similar profile or industry of activity around which there is a network of suppliers and recipients. In the case of a logistic cluster, geographical location is of great importance to its development, which can naturally influence the indication of transport and logistics as a key activity in the economy of a given region. It may be related to access to important transport routes, to the water or airport, to the logistics centre, which may become a major factor in the development of a logistics cluster in a given area. Infrastructure in an area is also emphasised by M. Zeinalnezhad (2011, p. 78). In addition, A. Leder-Pietrzko (2011, p. 46) mentions urban logistics as the basis for the functioning of the logistic cluster.

In conclusion, it can be stated that a logistic cluster can be considered as a new form of organisational solution in the logistic activity. It can develop on the basis of the existing logistics network as well as can be created according to the so-called bottom-up (on the initiative of enterprises) or top-down (supporting and promoting activities coming from the business environment) way of development (Staszewska & Barglik, 2010, pp. 218–221).

3. THE ROLE OF CLUSTERS IN CREATING INNOVATION

Nowadays, companies face high demands in development of innovation. At the same time, businesses show many barriers that undermine their drive and ability to generate and implement innovation. Those are, among others: financial constraints, lack of adequate resources, limitations in knowledge and skills and the risk of innovation. Considering the need for innovation, but also the fear of conducting this type of activity, companies more and more often search for ways to build such internal and external structures that would allow, on the one hand, to generate new solutions and, on the other, to reduce the problems and risks associated with them. Co-operation of entities within logistic clusters may be a solution to their problems.

In the development of innovation within a logistic cluster, organisation is influenced by the structures that are formed by cooperating and competing companies representing the TSL industry, as well as universities, R&D institutions, other providers of knowledge and innovative solutions, as well as intermediaries that transfer knowledge and innovation or provide financial support for the development of innovation (Dolińska, 2012, p. 65). Clusters build on mutual trust, good communication, cooperation, exchange of experience and technology. Consequently, their intent is to contribute to synergies that are also relevant to

business innovation (Stanienda, 2014, p. 190). Synergistic effects on the transfer and development of knowledge of companies participating in innovative processes within the cluster are also underlined by M. Dolińska (2012, p. 65). The characteristics that describe clusters allow for partnership and cooperation between enterprises and for the ability to create and transfer innovation (Stanienda, 2014, p. 193). The use of cluster structures creates favourable conditions for the development and marketing of new products and implementation of new technologies, as well as solutions of both procedural and organisational nature, the flow of knowledge and patent applications (Szuster, 2012, p. 323). M. Dolińska (2012, pp. 61–71), pointing out the role of clusters for the development of innovation, defines them as networks of innovation. In addition, clusters play an important role in the promotion of innovation, their application in enterprises and the growth of markets. A. Leder-Pietrzko (2011, p. 42) defines logistic clusters as activity incubators in such fields as: transfer of new logistics technologies, logistics education, promotion of new regional development ideas in the field of logistics, urban traffic engineering and environmental protection. J.S. Engel (2015, p. 37) emphasises the role of clusters in generation of innovation, speaking about the idea of innovative clusters (COI – cluster of innovation), defining them as important economic points in which new technologies are developed rapidly, and where the capital, knowledge and skills support the development of new branches of industry and new ways of doing business. At such points, human resources, capital or know-how are fluid, mobile between the participants. The importance of clusters, including logistics for innovation, is due to a number of factors, among which (Kowalski, 2014, pp. 182–183) mentions the following:

- easier access to information and the latest technological advances;
- easier access to limited resources and skills through their complementarity in cluster structures;
- greater capacity for joint research and development activities and other activities to support innovation;
- ability to ensure complementarity of interactions with other companies;
- increasing the speed of operation and enabling rapid response to ambient signals;
- reduced level of uncertainty and risk in business activities, which creates an atmosphere of mutual trust in a changing environment;
- development of human capital, resulting in greater mobility of workers and the organization of training or conferences;
- increasing the speed of operation and enabling rapid response to ambient signals.

4. CO-OPERATION IN CLUSTERS FOR DEVELOPING INNOVATION IN THE TSL INDUSTRY

Cluster initiatives are undertaken by various business entities, both in the industrial and service sectors, with logistics companies among them. Available literature includes very little characterisation of clusters in terms of their existence for the development of innovation in the TSL. Reports of the Polish Central Statistical Office (CSO), collect data on cooperation undertaken by various economic operators in the industrial and service sectors in three-year periods. One form of such cooperation is cluster initiatives. The activities of logistics companies are represented by several sections of the Polish Classification of Activity (PKD). Figure 2 shows the participation of companies representing the TSL industry, which, in the three study periods included, co-operated with other entities, forming cluster initiatives.

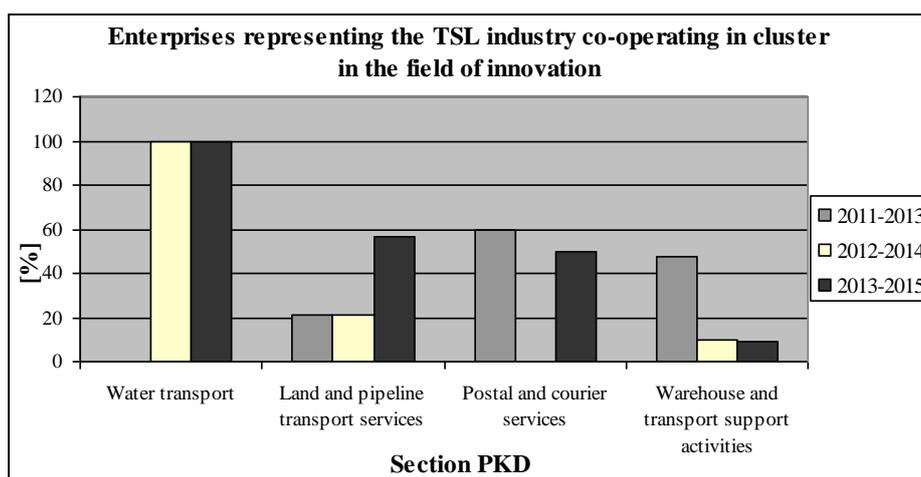


Fig. 2. TSL industry enterprises cooperating with other entities within cluster initiatives (percentage of enterprises undertaking cooperation in the field of innovative activities); source: own elaboration based on (GUS, 2014, p. 100; GUS, 2015, p. 108; GUS, 2016, p. 110).

TSL enterprises undertake cooperation within clusters in the field of innovation. First of all, the lack of a complete picture in this regard is due to the deficit of extensive research. Referring to the CSO data, there is no information on initiatives conducted in some research periods. In addition, there is a noticeable irregularity in this area. TSL companies are not very innovative. However, in the area of their cooperation in clusters in the framework of innovative activity against other service sectors, TSL companies seem to be promising. During the first

research period (2011–2013), two divisions representing the TSL industry were at the forefront of other service units (postal and courier activities, as well as storage and service activities supporting transportation). In the second research period (2012–2014), water transport was the largest contributor to cluster initiatives. During the third period of research (2013–2015) as many as three sections representing the TSL industry were ranked first (water transport, land and water transport, postal and courier services). Referring to the various sections of the PKD several characteristic features can be noticed:

- water transport: low and relatively stable level of innovative companies; Small and stable number of cooperating entities in terms of innovation activities; Very high share of clustering among cooperating entities;
- air transport: low level of innovative active companies, with significant growth in the second research period, stabilisation in the third period; Average number of cooperating entities in terms of innovation activities – significant decrease followed by a significant increase of cooperating entities; Lack of information on cluster initiatives. This is especially disadvantageous because of the average degree of cooperation of these entities for innovation activities;
- land and pipeline transport: very low and declining levels of innovative companies; Very small number of cooperating entities in the area of innovative activities; Significant increase in clustering among cooperating entities;
- postal and courier services: low level of innovative companies with little growth; Significantly decreasing number of cooperating entities in terms of innovation activity; average share of clustering among the cooperating entities;
- warehousing and service activities that support transport: low and relatively stable level of innovative companies; Average number of cooperating entities in terms of innovative activities – significant decrease followed by a slight increase in cooperating entities; Significantly reduced clustering among collaborating entities.

5. CONCLUSIONS

Growing requirements, such as time, timeliness, flexibility or cost, necessitate the implementation of modern, innovative solutions. However, creating and implementing these solutions is not an easy task, despite the fact that the TSL industry is developing very dynamically and has significant potential of innovation. Unfortunately, this results in a relatively low level of innovation in the TSL industry. The opportunity to improve this situation is to work with other entities that can contribute to reduction of barriers and, consequently, to the development

of innovation. One form of cooperation undertaken by TSLs is clusters. They belong to the forms strongly discussed in the literature, but their regular reference to the TSL industry is scarce. Also, in terms of economic practice in Poland, it can be stated that clustering initiatives related to the development of innovation belong to expanding ones. This is evident in the CSO data which, in the subsequent data collection periods, shows an increase in the number of enterprises involved in clusters in the total number of entities cooperating in the area of innovation activities. In the years 2013–2015, 20.8% of the surveyed entities in the service sector which cooperated for the development of innovation took part in clustering structures (compared to 13.4% in the period of 2012–2014). Against this background, as shown in this article, the TSL industry compares quite favourably. It can be said that those entities have increasingly been involved in cluster initiatives for the development of innovation. The involvement of the TSL industry in clusters gives them a range of development opportunities through greater integration of participants, which allows them to create joint investment, as well as research and development projects. It also enables the continuous development of enterprise competencies and the application of modern logistics solutions.

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BIOGRAPHICAL NOTES

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