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**Theory and concept of cluster**

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**Abstract:** Today, international competition and the appreciation of the life cycle of products shortened greatly affect the operation of enterprises, the fundamental objective is to meet the customer demands a higher standard of quality and a lower price. The last century brought significant changes to the automotive industry and represents a significant economic and technological force in the life of countries connected to the industry. [1] To develop and increase competitive of companies a cluster organization can help in this. The authors are investigating the goals and types of cluster based on the researches and seconder studies. The goal of the research is to showcase the theoretical background and different types and functioning of the cluster organisation

**Keywords:** cluster, industry competitive, network, supply chain

**1. The concept of the cluster**

One defination for the cluster is such a horizontally or vertically connected integration of individual companies with legal entity, which work together with the connected social institutions, in the same sector. They are close to each other regionally, market competitors and collaborators. They are connected by the long term business dynamics, the innovation, the business conduct of jointly rationalised cost reducing and efficiency-enhancing activities. The cluster is a non-profit organisation. The costs of its work are covered by the savings and the extra result from the market, which is created for them by the cluster’s activity. The cluster performs its activity of the based on the jointly created and accepted contract. A cluster, depending on the market segment, industry and goals, can be vertically (in case of activities built upon each other) or horizontally organised (in case of parallel activities). [2].

Territorially it is usually of regional character.

*SME structures – The structure of the vertical network*

Networking warrants opportunities for stepping out onto the international market. The SMEs possess such partners from the beginning who stimulate their development. Learning process of benchmarking character may appear as well. Multiplicative effects might develop too. The successfulness of enterprises already supplying also motivates other SMEs to develop and to become suppliers. The financial mediators also finance more likely the SMEs which have connections with big enterprises. [3]

*SME structures – The structure of the horizontal network*

SMEs of roughly the same strength cooperate. The goals of the collaboration can vary, its classical forms of manifestation are: collaboration in the field of marketing, product development, procurement. It can be also generally established, that the network’s goal of priority is to overcome the disadvantages originating from the economies of scale. Increasing innovative and learning capacity is a characteristic (together they can obtain, filter and use the information much better). Such a strategic alliance with no independent legal personality of the companies, which differs from the already known business groupings in more aspects, we could say it is more and more modern too. [3]

According to the *EU DG Enterprise, enterprise cluster*

The cluster is a group of such interdependent enterprises and connected institutions, which:

* are collaborative and competitive;
* are concentrated geographically in one region or more (the cluster can also have a global extent);
* are concentrated on a defined field/branch, are connected by common technologies and abilities;
* are science-based or traditional.

The clusters can become an institution (they can have a cluster manager) or they can function in a non-institutional form. The clusters have a positive effect on:

* the innovation and competitiveness;
* the formation of know-how
* the growth and long-term business dynamics.

According to one study of the European Commission 4 schools have developed to define the clusters: [4]

* The central category of the *Italian school* is created by the industrial districts formed by the spatial concentration of the small and middle enterprises who perform similar activity
* *The Californian school* places the emphasis to the networks created by the production links formed through the vertical disintegration
* In the cluster perception of *the Northern or Scandinavian school* exclusively the locally usable knowledge, especially the non-codified, hidden knowledge, as well as the innovations arising from its effect play a highlighted role.
* According to *Porter’s Cluster* approach all of the schools above are stationary, he characterised the cluster as a process rooted in the social systems of the analysed region; the main emphasis is rather on the local-specific elements. Unlike them, Porter first of all analysed competitive advantages of enterprise level and their sources, not the regional economy and the clusters. The basis of the cluster in his case is created by the cooperation and informational flow between enterprises and institutions. [9]

2. **The grouping of the clusters**

The clusters can be grouped based on their level of development, organisational strategy, respectively we can differentiate other regional and industry-based clusters.

Based on their **level of development** they can be: [5]

* *Advanced cluster:* they operate in a developed economic environment with a completely established cluster structure. They possess a high R+D potential, which is an indispensable factor for the development and competitiveness of the cluster.
* *Developing cluster:* Stagnant markets provide the frames of the operating cluster. The structure of the cluster is stable, but it is not complete compared to an established advanced cluster. It possesses a secure R + D potential indispensable for the secure market.
* *Potential cluster:* Dynamic competitive enterprises provide the foundation of the cluster. The R + D activity is showing a constantly increasing tendency. They own all the qualities to establish a well-functioning cluster, only the initial step is missing.
* *Latent cluster:* we can talk about a latent cluster when the players are given but the real driving force is missing. This deficit is most often triggered by the the lack of international markets*.*

Based on the organisational strategy the clusters can be [6]

* *Cluster influenced by globalisation:* A determining enterprise is a multinational enterprise, which sells its products on the international market. Thus, maintaining the market positions is dependent on the global factors.
* *Resource-based cluster:* It focuses on the efficient exploitation of the natural resources of the given region. Usually in these regions the R + D potential is adequate.
* *Politics-driven cluster:* The government defines the means of development of the strategic industries and supports the cluster in reaching and sustaining international competitiveness. Usually the clusters belonging to this type are connected to the development of some special technological capability. [10]

3. **Differences between industry and regional clusters**

We also distinguish industry and regional (area based) clusters. [7]

The **industry cluster** can be described as a network of enterprises who are strongly and mutually connected in a value increasing production (supply) chain, which is completed by specialised providers and other institutions. In essence, we are talking about the sum of value chain-systems of a given industry within a country, to which other institutions also connect. In case of industry clusters locality is not a criterium, instead the importance (weight) within the national economy is regarded as relevant, namely the key sectors of a country are listed here. This approach has spread mainly in smaller countries (The Netherlands, Finland), and is mainly used in the industries connected to innovation, where in many cases the spatiality is secondary, because the cooperation based on common language, culture, the cooperation between a few prominent institutions (university, development institution) based on personal contacts within the relatively small number of experts is more important.

The **industry clusters** can be typed based on the level of aggregation:

* *Mega-cluster,* which is essentially such a group in the industry, whose belonging organisations and business partners are connected to a broad circle of economic activities and define the development of the whole national economy (i.e. telecommunications in Finland, tourism in Greece, the financial industry in Switzerland, etc.)
* *Mezo-cluster,* which consists of the competing enterprises and value chain-systems of a given industry, as well as the connected industrial institutions (i.e. ceramic industry, furniture industry, milk industry, etc.)
* *Micro-cluster,* which means most of the time the value chain-system of one-two enterprises belonging to the industry, their supplier, subcontractor, commercial network.

**Regional (area) cluster** means the geographical concentration based on the innovative relation system of competing and cooperating enterprises of a given industry, and the connected and supporting industries, financial institutions, providing and cooperating infrastructural (background institutions (education, professional training, research), entrepreneurial associations (chambers, professional associations, clubs). In essence, the industry and the geographical concentration combined. This view has spread firstly in the countries of wide areas (i.e. USA, Canada), secondly in the countries which prioritized the development of SMEs. The development of regional clusters can only be successful with bottom-up strategies, in a decentralised fashion, where the coordinating role of regional and local governments is also very important. When differentiating the regional clusters, the spread of the regional base is the important differentiating criterion, because we need to always look at the catchment areas drawn by the real economic relations, and not the administrative regional units. The three types of regional clusters according to the spread of regional base: [7]

* *Macro cluster,* which has the whole country as its base, hence the competing enterprises of the industry, their suppliers or partner organisations can be found in almost all of the regions.
* *Regional cluster,* when the competing enterprises of the industry and the connected institutions are concentrated geographically, their regional base is a region, or a big city and its agglomeration.
* *Local cluster,* which is operating mostly in a place, or in a workforce agglomeration (commuter zone), consisting primarily of local networks of small- and middle-enterprises (SMEs)

1. **The goal of clusters**

Looking at the fact that the cluster is a cooperation of autonomous partners, the parties themselves decide what the function of the cover would cover.

Formulating in a very general manner it can be said that the primary role of the cluster is the reduction of the transactional costs within the region, respectively maintaining it at a low level. This can be observed in the smaller search costs, the quicker identification of the existing needs, the quick transfer of knowledge within the cluster, in the bigger trust between the partners belonging to the same cluster. From this results that the cluster can theoretically help the entrepreneurs in any activity. [8]

It can be characterized mostly by the following points:

* *innovative policy, research-development:* we should understand by this not only the innovative activity connected to the products and their production, but also the organisational innovations (i.e. new management structures) and the leadership innovations (i.e. new performance evaluating system);
* *the good relationship maintained with the local state organs, public institutions:* this means partly developing a more suitable state regulation and procedures for the enterprises, moreover the better usage of state subsidies, since through the clusters project which are based on already existent (and perceptible) needs can be supported;
* *education and formation:* the local educational institutions and enterprises know the needs of the enterprises of the cluster better, they can better adapt to them, which increases the competitiveness of the local workforce – and enterprises, and reduces unemployment;
* *performing business activities together, by which increasing scale of economies can be realised:* such as common marketing, shared use of sales channels – these can obviously largely depend on the particularities of the industry and other characteristics.

1. **Summary**

This topic can be called current because cluster-oriented politics does not look back to a great past. The practical functioning of clusters became known in Hungary close to 20 years ago, when with a pioneer role. Today the clusters already get a role in the progress and shaping the increase of competitiveness of SMEs, and these, trust-based networks may help the small enterprises utilize special resources by sharing the knowledge, and by the fact that the benefits of these can be reached with smaller costs compared to those outside the cluster. In the research, the authors analyse the backround of clusters and the differences among different types of clusters.

**6. Bibliographical references**

1. Bergman, E.M.–Feser, E.J. (1999) Industry Clusters: A Methodology and Framework for Regional Development Policy in the United States. – Boosting Innovation. The Cluster Approach. OECD, Paris. pp.243-268.
2. Deák Sz*.* (2002) A klaszter-alapú gazdaságfejlesztés. – Hetesi E. (szerk.) A közszolgáltatások marketingje és menedzsmentje. SZTE Gazdaságtudományi Kar Közleményei (2002) JATEPress, Szeged. 102-121. o.
3. DeBresson, C.– Hu, X*.* (1999) Identifying Clusters of Innovative Activity: A New Approach and a Toolbox. – Boosting Innovation. The Cluster Approach. OECD, Paris. 27-59. o.
4. J. Cselényi, B. Illés: Logisztikai rendszerek. Miskolci Egyetemi Kiadó. 2004
5. Kocziszky Gy. (szerk) (2007) Hálózati modellek felépítése*.* Miskolc
6. *Lengyel I.* (2001) Iparági és regionális klaszterek. Tipizálásuk, térbeliségük és fejlesztésük főbb kérdései. – Vezetéstudomány. 32. 10. 19-43. o.
7. Luukkainen, S. (2001) Industrial Clusters in the Finnish Economy. – Innovative Clusters: Drivers of National Innovation. OECD, Paris. 273-288. o.
8. Nagy Z. (szerk.) (2007) Beszállítói hálózatok építése. Miskolc
9. Szintay I. – Veresné S. M. (szerk.) (2006) Hálózat és kapcsolat menedzsment Miskolc
10. Tóthné Szita K. (2007) Hálózat és klaszter szervezési gyakorlatok Miskolc