

THE CLUSTERS FUNCTION IN ACHIEVEMENT OF COMPETITIVENESS

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Abstract: Contemporary competitiveness depends on productivity but not on its approach to production factors or company size. Productivity lies on a competition of companies, that is, organizations can improve productivity in any branch if use sophisticated methods, advanced technologies and offer unique products and services. Sophistication by which the company competes in certain area is greatly affected by quality of local business environment. Clusters operate on competitiveness of organizations in three ways: first, by increase of productivity of the companies in environment, second, supporting and managing the innovations contributing the productivity increase, and third, enhancing the initiation of the new business enlarging and strengthening the cluster.

Key words: clusters, competitiveness, productivity, complementary, innovations, motivation, new business forms

KLASTERI U FUNKCIJI POSTIZANJA KONKURENTNOSTI

Rezime: Moderna konkurentnost zavisi od produktivnosti, a ne od pristupa proizvodnim faktorima ili od veličine preduzeća. Produktivnost počiva na tome kako se kompanije nadmeću, odnosno, organizacije mogu da povećaju produktivnost u bilo kojoj grani ukoliko koriste sofisticirane metode, napredne tehnologije i nude jedinstvene proizvode i usluge. Sofisticiranost kojom se kompanije nadmeću u određenoj oblasti je pod velikim uticajem kvaliteta lokalnog poslovnog okruženja. Klasteri utiču na konkurentnost organizacija na tri načina: prvi, podizanjem produktivnosti kompanija u okruženju, drugi, podržavanjem i upravljanem inovacijama koje podupiru rast produktivnosti, i treće, podsticanjem pokretanja novih poslova koji proširuju i ojačavaju klaster.

Gljučne riječi: Klasteri, konkurentnost, produktivnost, komplementarnost, inovacije, motivacija, nove forme biznisa

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1 CLUSTERS AND PRODUCTIVITY

Membership in clusters enables companies to be more productive in acquisition of inputs, approach to information, technology, important institutions, and coordination with related companies, progress measuring and motivation [1].

Organizations within the cluster have better access to specialized and experience work forces and in this way they shorten the time of search for work force and the selection and recruitment costs. Reason for this is that clusters offer better opportunities for improvement and decrease fluctuation of employees. Besides this clusters attract easily talented people from other locations. In addition, well developed clusters have better possibilities for obtaining other important inputs. Clusters have broad and specialized basis of suppliers enabling them to obtain inputs from local instead global level which results in decrease of transaction costs, stocks, import costs, interruptions, etc. Vicinity improves communication and facilitates suppliers in timely fulfillment of obligations as well as to provide post-sales services such as installation and removal of deficiencies [6].

Information on competition, market and technological changes are faster accumulated within the cluster so that cluster's members have an advantage in approach to information. In addition, personal relationships and communication connections establish a trust and make easier the information flow. These conditions enable easier transfer of information through cluster [9].

Connections between the cluster members ensure that result is more favorable than sum of results of individual members. Synergic effect is revealed. For example, in typical tourism cluster the quality of client's experience does not depend on primary event but on quality and efficiency of corresponding contents such as hotels, restaurant, shops, quality of public transport, etc.. The reason is that members of the cluster are mutually dependent so the success of one of them directly operates on success of other. Complementary appears in many forms. The most obvious example is when organizations are complementary in meeting of clients' needs (tourism example). Special complementarities emerge from marketing. Clusters very often improve/increase reputation of certain location in certain area which as a consequence has that buyers will address to seller coming from that area firstly [8].

Government investments, such as investment into infrastructure and education programs, in great extent

operate on productivity of organizations. Possibility to recruit a work force adequately skilled will decrease costs of training in the organization. Besides the state, there are other organizations that create the public interest increasing productivity in public sector. Investments of organizations into training programs, infrastructure, laboratories, etc, contribute to productivity. Such private investments very often are made by jointly because clusters can recognize the opportunity for common progress [9] and [1].

Local rivalry operates on organization with motivation. Pressure of other organizations increases competition within the cluster even in organizations which are not the competition but indirect competition. Wish to look „good“ in local community will encourage organizations to try to outgo others. Clusters enable easier way of measuring and comparison of performance as all those organizations run a business under influence of the same circumstances, e.g. operation costs and market approach, and besides that perform similar activities. Managers are able to compare costs and performance of employees with other organizations [16].

2 CLUSTERS AND INNOVATIONS

In addition that clusters significantly operate on productivity, it is important to highlight that clusters play important role in improvement of organizational capability for innovations. Specified factors which increase current productivity have a great influence on organizational innovation as well. Reason for this is that buyers are often participants in clusters and hence the organizations members of clusters have better view on market than organizations acting independently. Moreover, connections with other organizations within the cluster helps companies to be first to learn on technologies in development, availability of machines and various components, service and marketing concepts, etc. Such learning is facilitated by undisturbed and often visits and permanent direct contact. Clusters not enable observation of innovation only but provide the possibility and flexibility to act quickly. Organizations within clusters have an opportunity to obtain elements before others needed for implementation of innovation and to experiment with less cost [10].

Innovations and new perceptions within cluster are being built on interaction of several technologically connected participants such as relation buyer-supplier or industry-university. There are four characteristic to

be identified as important for understanding the innovative processes in clusters [17]:

1. Innovation is based on process of incremental reduction of technological and economical weaknesses where new technologies, subjected to numerous modifications and business models, are adjusted to such process.

2. Innovations are based on continuous interactions through entire cluster, establishing the connections and specific communication model. This process of exchange and creation of new knowledge is enhanced by personal (face to face) contact.

3. Certain innovations are partially a result of technology transfer process, transfer of knowledge through academic education, action of regional private-public organizations focused on networking and commercialization of new discoveries.

4. Innovations find incentive in environment where various resources may be constantly rearranged under lower costs, through mobility of qualified work force, public stock exchange offer (IPO) and through other financial restructuring models.²

Innovation incitement is under pressure of competition, pressure of other participants in cluster, permanent comparisons appearing in the cluster, etc. Many empirical studies have confirmed that there is a strong connection between clusters and innovations. Using the data from European Cluster Observatory it can be concluded that there is a link between the power and number of clusters in the region and innovative performances (number of patents). Those regions without clusters show weak performances from the point of innovation. From other side, European regions with clusters have much better performances. However, the power of cluster is not being determined by the level of regional innovation but the economic environment is of significance such as work force quality, research and education, access to business capital, good infrastructure, etc [11] and [6].

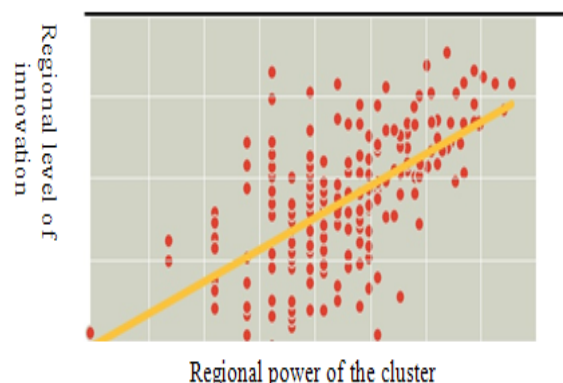


Figure 1 : Influence of cluster on innovation level

Source: Data from European Cluster Observatory. ISC/CSC cluster codes 1.0, dataset 2007analysis.

3 CLUSTERS AND NEW BUSINESS FORMS

It is not strange that the most of new organizations within the cluster growth faster than those operating independently. New suppliers, for example, have a good starting position within the cluster since they meet with broad basis of buyers and this reduce their risk and enable them better review of market opportunities. Moreover, developed clusters include related industries using similar or the same inputs presenting to suppliers additional possibility for success. Clusters are suitable for new business forms for many reasons. Individuals who work in clusters can observe product deficiencies much easier and that basis could develop own business. Besides this, barriers for access are less than anywhere else. Required assets, skills, inputs and personnel are usually available immediately and wait to be built in into new entrepreneurial business. Local financial institutions and investors cooperating with existing cluster may require less interest rate due to lower risk. In addition, clusters present important local market so that entrepreneurs can have the benefit from existing connections within the cluster as well. New business forms within the cluster are the part of positive feedback action. Increasing cluster strengthens these activities, improve the scope of competition resources which benefit to all cluster members. The final result is that organizations within cluster have relative advantage in relation to those acting isolated [10].

² Sölvell, Ö., Clusters: Balancing Evolutionary and Constructive Forces, Ivory Tower, Stockholm, 2008, p.37

4 BENEFITS FROM CLUSTERS

Networking of organizations into clusters brings certain advantages. In this way organizations have an access to large number of suppliers, experience work force as well as a possibility for transfer of knowledge between various participants. Organizations have a benefit from synergic effect since by mutual action use their resources in a better way than if do a business independently. Synergic effect can be presented as follows [9]:

$$f(a,b,c) > f(a) + f(b) + f(c)$$

Among all advantages offered by the cluster none is so important as access to innovation, knowledge and know-how. In contemporary economy based on knowledge, organizations seek their advantage through access to new, innovative ideas requiring geographical concentration of suppliers, buyers, highly qualified work force, development and research centers and industrial leaders. Empiric researches have shown that knowledge and know-how within certain industry are easily and faster accumulated and dispersed within innovative organization if participate in the cluster. Networking of organizations in clusters enables them to learn quickly on development in technology and change in consumers' behavior.

Benefits offered by the cluster can be divided into two groups: „hard“and „soft“benefits. „Hard“benefits are coming from more efficient business transactions,

„wise“investment and reduced expenditures. „Soft“benefits are derived from permanent possibility for organizations to learn, benchmarking and from exchange of experience improving the knowledge leading to innovation and business development. Advantage observed and measured firstly is the one arising from concentration of required resources for certain business activity. Those resources, besides necessary inputs for production process, include some accompanying, specialized services. Such services include banks and accounting agencies with good knowledge of the market, consultants who are capable to solve specific problems, marketing agencies with good knowledge of consumers, etc [15].

Among the most important „hard“benefits is the access to educated and experienced work force in the cluster environment. Especially important is the work force with knowledge of specific profession because such work force can't be found so quickly. Presence of local suppliers is advantage, but in those industries where specific inputs are built in the product. In present business conditions the information and telecommunication technologies reduce the importance of distance of suppliers who provide companies with standardized inputs. Vicinity is important from the point of possibility to acquire specific inputs intensive with knowledge and depend on interactive research or necessary support in utilization. The chain of supply provides certain advantages but less than it was a case in 20th century.

Table 1: „Hard“benefits from clusters

Factor	Benefits
Speicalized work force	Better productivity
Specialized services	Fast and easy access
Input selection	Less costs, better quality
Spectrum of companies	Joint ventures, opportunity

Table 2: „Soft“benefits from clusters

Factor	Benefits
Consolidation	Common vision, planning, influence
Trust	Cooperation and trust beteen companies
Learning (1)	Transfer of technology and innovations
Learning (2)	Know- how

„Soft“ advantages present invisible factors which appear at networking of organizations and which can't be directly connected with profit or express quantitatively, but in many cases have a larger influence on business than „hard“ benefits. Benefits from these factors come from mobility of work force, flow of information and knowledge between organizations through formal and informal talks and discussions with other organizations, suppliers and consumers. Innovations present common and repeating processes and environment that encourages people to share their ideas promotes innovations in technology, products and processes. Advantage is in easy acquisition of knowledge, i.e. know-how owned by certain individuals and which is not formally published. Transfer of such form of knowledge requires personal contact and organization of business cooperation, organization of professional, social and other meetings [13].

5 DYNAMISM OF CLUSTERS AND COMPETITIVENESS

Dynamism presents a special dimension in clusters research and is expressed through the number and quality of connections within the cluster and number of external connection with international market. Variables such as mobility of production factors, networking level and dynamism in general are different between certain clusters. Dynamic clusters present basis for sophisticated strategies and have a role of driving force from the aspect of improvement of operations and innovations among existing organizations. Dynamism of clusters is important because [3]:

1. Organizations within clusters developing strategies and programs based on value chain create new organizational capacities through the process of internal competition.
2. Organizations in dynamic cluster share many activities through cooperation, such as exchange of technology, components or products.
3. Organizations within dynamic clusters function much more efficiently, using specialized instruments, relationships with suppliers and buyers in short periods. Resources and possibilities in the organizations, important for operation, may be acquired easily through developed network within the cluster.
4. Organizations within dynamic clusters may achieve top level of innovation and knowledge.

Transfer of knowledge and daily interactions with buyers, suppliers and organizations, contributes to permanent improvements which present the basis for both technical (improvement of products and process) and other innovation (business model improvement).

5. Dynamic clusters create the environment where various resources (capital, work force, technology, etc.) may be „restructured“ quickly and mixed to create new and better combination of skills, capital and technology.
6. A number of new organizations within dynamic clusters have a growth tendency. Organizations which commence operation within the cluster are relayed on close cooperation with suppliers and buyers. The price of failure is usually minor within the cluster where many other opportunities are available.
7. Dynamic clusters in most cases present leading markets where buyers encourage development of technologies and innovations through tight interaction with suppliers.³

In addition, there are certain internal limitations that could influence to dynamism of the cluster (adapted according to Hannan and Freeman, 1984):

1. Investments into plants, equipment and specialized work force and infrastructure decreasing flexibility.
2. Increased ethnocentrism and NIH (not invented here) syndrome which denies all coming from environment.
3. Political limitation.
4. Rigid institution restraining changes in strategies and technologies.

External limitations mostly arose from technological changes out of clusters or due to war activities or some other exogenous factors.

6 CLUSTERS IN GLOBAL ECONOMY

Location of organizations has become important for economic success in global economy. General impression was that economical and technological

³ Sölvell, Ö., Clusters: Balancing Evolutionary and Constructive Forces, Ivory Tower, Stockholm, 2008, p.19

changes occurred due to globalization, will diminish the role of location and therefore the cluster's role. However, economic reality rejected such position and shown that location from the economic point of view remained as important factor in understanding of differences in economic growth and prosperity between states and regions [12] and [5].

Lower trading costs, changes in technology, economic policy in many states as well as changes within the global trade have made competition much more international and intensive. Increased competition forces organization to be more focused on productivity and especially to innovations and knowledge. Organization has to use chances offered by global economy in order to become more efficient and innovative so that hold its market position.

Globalization has increased the role of cluster in two ways. First, competitive advantage placed in intensive local interaction within clusters got larger importance, as well as other sources of competitive advantage in regard with unequal approach to technology and inputs. Although competitors may cooperate with the same suppliers regardless to its location they, still can't utilize all connections and privilege provided by membership in the cluster. Second, knowledge has become important factor in value creation that increased the role of clusters because they present a key innovation factor relaying on ideas which continuously flow among organizations and research institutes, very often on non-structured and unplanned way. While technology became broadly available, unstructured knowledge creating the top value, remains bound to certain people and places.⁴

Globalization has not just increased the role of clusters and location but improved conditions of demand to be met by successful clusters, such as:

- Competition between clusters has increased. More and more locations fight to perform certain business activities which results in pressure to become aware of strong sides of competition..
- Increased competition forces clusters to be more specialized and to develop clear strategic positions. In the past, strong clusters had similar profile, but today there is a differentiation regarding activities (research and development,

production, services, etc.) and market segmentation.

- Increased specialization level operates on number and intensity of connections between clusters and made that presence of such connections presents a key factor of the strong cluster. While in the past clusters presented isolated isles competing mutually, today they are the part of the global value where, very often, simultaneously compete and cooperate with each other.

Many industries have developed a global chain of value, as the answer to such changes in global economy, where the group of specialized clusters had developed complementary activities to serve markets of the large number of states.

7 CLUSTER INITIATIVES

Cluster initiatives are defined as organized efforts of organization and public sector in order to increase the growth and competitiveness of clusters. Cluster initiatives mostly include six key goals, specifically:

- *Improvement of the human resource sector* through professional training and education of employees. Such efforts could be focused to various target groups of people. Good examples are efforts to attract and keep students in certain region.
- *Clusters expansion* through fostering of investment in the region in order to increase the number of organizations participating in the cluster. One of ways to achieve this is support in formation of new organizations or attraction of organizations from the region. Incubators, as well, present the instrument for expansion of clusters. They offer a support in providing of physical equipment, preparation of financial and business plans, affiliation of entrepreneurs with financial institutions and possible buyers.
- *Promotion of business development* through various operations, such as e.g. support in export promotion.
- *Promotion of commercial cooperation* so that companies communicate with each other, e.g. through mutual purchasing or exchange of service to decrease expenditures.
- *Promotion of innovation* through networking and improvement of cooperation between companies or through improvement of

⁴ Ketels, C., *The Role of Clusters in the Chemical Industry*, Harvard Business School, 2007, p. 11

cooperation between business sector and research/academic sector.

- *Improvement of business environment* betterment of microeconomic business conditions (improvement of legal and institutional environment as well as physical infrastructure).

Cluster initiatives are faced with various challenges in their endeavor to develop and improve clusters competitiveness. Due to impact of development policy of small and mid companies in some states the support to small companies and those in formation is more expressed. In addition, due to minor participation of large companies there are certain prejudices on large multinational companies. In order to achieve a full effect of cluster initiatives it is necessary that all types of organization be connected regardless to their size or ownership. Besides this, the role of state is very often limited on providing of financial incentive only. Although this is of great importance for initiation of common activities, there is still missing the public sector involvement in elimination of barriers preventing the productivity growth and innovations. Further challenge relates to research of possibilities of regional clusters networking and to become complementary part of the value chain in certain economic sector. Cooperation of clusters is amounted to exchange of operational experience for now. Certain challenges appear even in view of prejudices on technologically-intensive clusters considered to present the large economic potential. Clusters policy is based on such prejudices even the case is that service-intensive clusters very often present larger potential (transport, financial services, tourism, entertainment, ...).

Cluster initiatives do not present universal remedy. They represent a reflection of increasing environmental complexity where the success depends on individual performance, but on many decisions of independent employers and government. Cluster initiatives present unique platform for coordination of activities in conditions of multiple interdependency, but without limitation on the impact of competition.⁵

⁵ Ketels, C., *The Role of Clusters in the Chemical Industry*, Harvard Business School, 2007, p. 15

8 CONCLUSION

Clusters in great extent may enhance the competitiveness of organizations in global economy as a location has, in dynamic economic environment, a significant role in improvement of competitiveness advantage. Of course, this statement should not be understood verbatim since clusters do not present universal remedy with success guaranteed. Clusters as a form of economic networking of organizations provides a numerous advantages to its members, but to become concretized such advantages should meet certain preconditions. Proactive management position is one of the key preconditions which have to recognize all advantages provided by such networking and ways such advantages could be utilized. Clusters enable increase of competitiveness through creation of such environment advisable for: innovation, entrepreneurship and increased productivity. Particular advantage emerges from the state involvement in development of appropriate infrastructure for clusters activity as well as participation of educational and research institutions which in synergic action with other participants, significantly operates on final clusters' success.

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