

## Cooperation vs. Innovativeness of Entities as Methods to Increase Competitiveness in Economic Conditions

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### Abstract

The requirements of contemporary economies determine the behavior of entities in the markets - they concentrate around multi-faceted connections and forms of cooperation. Both economists and business practitioners believe that such forms of cooperation are necessary where the entities are focused on very active development, innovative and competitive behavior.

The considerations of this article focus around this topic. For years, research related to this subject has been conducted by the Polish Agency for Enterprise Development (PARP). It is an entity very involved in entrepreneurial processes in Poland - implements programs of economic development, supports innovative and research activities of small and medium enterprises as well as regional development, export growth, development of human resources and the use of new technologies in business. This is why the results of PARP research are quoted in the article.

*Keywords: Cooperation, innovativeness, economic conditions, competitiveness*

### 1. Introduction

Due to the variability and tumultuous nature of their environment, modern enterprises have to look for innovative methods to improve competitiveness. This is because solutions limited to the lowering of the cost of production or business operation turn out to be insufficient. Therefore, searching for and implementation of modern methods of company management as a whole are a very important element of the operation of an enterprise. This system should be regarded as a process aimed at continuous improvement of competitiveness and company value. Hence, its interdisciplinary nature should be borne in mind.

One of modern methods of improving competitiveness involves operation of enterprises on the basis of a cluster. This method is particularly new in Poland. This form of organizing business operation, using synergy effect, is widely known in highly developed countries. However, in Poland's economy it is still generally believed that any enterprise offering products (services) satisfying the same needs is only a competitor. Abandoning this line of thinking and entering into relationships with other entities can help to increase not only the innovativeness of companies but also their competitiveness.

The article uses a descriptive and comparative research methods, which were determined by the type of available research materials.

### 2. Material and method

#### 2.1 Cluster in economic theory

A cluster was first used in economic terms by M. E. Porter. He characterized this form of cooperation as a set of enterprises operating in the geographical vicinity and institutions interacting with them (R&D units, universities, associations). Participants in the cluster are mutually related, work together but also compete with one another [1]. In contrast, their interactions and the produced synergy effect, affect the faster development of the economy, especially in the region where these clusters exist. A cluster is most often characterized by the following factors:

- spatial concentration (of enterprises, institutions),
- sectoral concentration (a cluster consists of organizations operating in the same, related or complementary sectors),
- common trajectory of development (e.g. knowledge bases),
- parallel operation in competitive conditions and cooperative relations,
- formal and informal links between organizations [2, 3].

The following determinants affect the formation and development of clusters:

- extension of a cluster's offer (cost reduction, greater choice of intermediate products offered, components and professional services in connection with the transfer of companies operating in related sectors to the area of cluster operation);

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- increase of interaction (possible better use of resources and potential through cooperation in selected areas);
- lower transaction costs;
- reduction of uncertainty (especially in terms of technological development thanks to cooperation between a number of entities it is much less likely that any factor goes unnoticed or omitted in the analysis). [4]

The process of the formation of clusters is as follows:

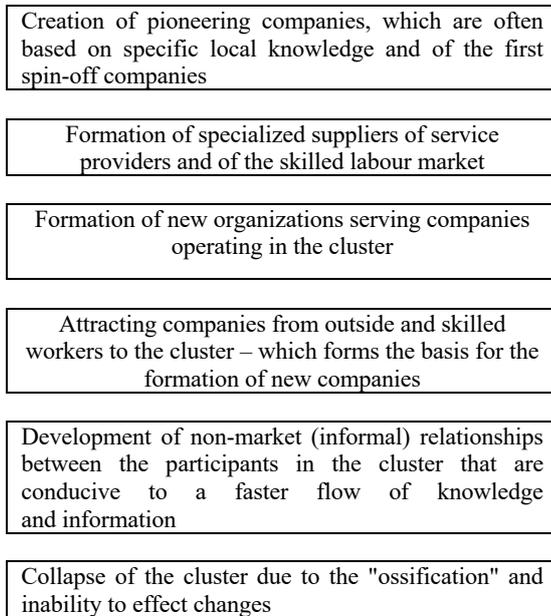


Fig. 1 Stages of model cluster formation

Source: Szultka, S. (2004). *Klasy. Innowacyjne wyzwania dla Polski*. Gdańsk: IBnGR. p. 10.

In the pertinent literature (which is still relatively poor as far as operation of clusters is concerned) a number of classification of clusters can be found:

Table 1 Typology of clusters

Division criteria	Types of clusters
Stage of development	Embryonic, established, mature and declining clusters – this division is analogous to Vernon's product life cycle theory
Ability to create jobs	Clusters with growing, stable or decreasing employment levels
Territorial scope of a cluster	Clusters of local, regional, national, transnational scope
Number of horizontally connected industries	Narrow or broad clusters
Number of stages in the production chain	Deep clusters – usually covering all stages of the production chain; shallow clusters – comprising one or more stages
Competitive position	Clusters that are world or national leaders or of average or weak competitive position
Measurement of technological advancement	Clusters of high, medium or low technology. Some authors distinguish high or low innovative clusters rather than high- and low-tech ones

Source: Szultka, S. (2004). *Klasy. Innowacyjne wyzwania dla Polski*. Gdańsk: IBnGR. p. 14.

1. According to the OECD (criteria apply to innovative processes):

- a. clusters based on knowledge – concentrate companies for which direct access to basic research and public research institutions and universities is important (characteristic of an aerospace, chemical, electronics industry);
- b. clusters based on economies of scale – concentrate companies related to technical institutes and universities, conducting their own research on a limited scale (characteristic of an automotive, engineering industry);
- c. clusters of specialized suppliers – concentrate companies with high R&D intensity which put emphasis on product innovations; these companies are usually located close to each other as well as to customers and users (characteristic of companies producing components for complex manufacturing systems, such as software and hardware);
- d. clusters dependent on the supplier – concentrate companies which import technologies in the form of capital goods and intermediate products, whose innovative activity is determined by their ability to interact with both suppliers and providers of after-sales services (characteristic of traditional industries: manufacturing, textile, agriculture, forestry, furniture, metal and service sector). [5]

2. Division by the size and structure of companies belonging to a cluster

- a. cluster similar to Italian industrial districts. Its most well-known example is the famous American Silicon Valley. Clusters of this type are characterized by, inter alia: the dominance of small and medium-sized enterprises, strong specialization, as well as fierce rivalry. Their foundation is a networking system based primarily on trust. The occurrence of these factors allows, among other things, flexible specialization, high productivity and building of innovative capacity;
- b. hub-and-spoke cluster characterized by interaction of large local companies hierarchically related with an extensive group of SMEs (e.g. Seattle–Boeing and Toyota City). A cluster of this type is based largely on the strength of large local corporations, but at the same time is characterized by operating flexibility and the use of cost advantages;
- c. satellite cluster with a dominant share of SMEs dependent on external companies, whose location advantage is based generally on lower costs (e.g. Research Triangle Park in North Carolina, the region of Manaus in Brazil). [4]

Participation of enterprises in clusters is associated with a number of benefits that can translate into an increase of its competitiveness. These benefits include:

- increasing specialization allowing each operator to focus on its core competencies;
- acquiring and adding complementary competencies through the acquisition of new knowledge and experience or entrusting a competent partner with a task;
- extension of the range of offered products and the ability to offer a complete system of solutions and processes;
- better use of available resources and production capacity;

- building of a know-how base;
- improved access to information and reduced uncertainty (exchange of experience);
- use of support for participants (services and practical solutions) usually organized by the initiative;
- increasing revenues thanks to new sales channels, more accessible information about new markets, reduced barriers to entry;
- access to infrastructure created for the needs of a cluster;
- growth of innovativeness through increased cooperation with the research and development entities [6].

Entrepreneurs who decide to cooperate in a cluster must, however, remember that:

- they will not have a monopoly on the use of solutions (licenses or patents) in the jointly developed new products and services;
- profits are shared among the participants in a cluster;
- competitors will have greater opportunity to learn the know-how of an enterprise (at least in part);
- implementation of new solutions will sometimes take a fairly long time associated with the coordination of activities of all partners;
- they will be charged with additional tasks that must be undertaken along with regular everyday business tasks (such as time available for meetings within a network and associated costs).

The presented analysis of rules of cluster operation shows the importance of a flow of resources between system participants. In the context of this type of relationships knowledge has several meanings and takes on a special overtone. Firstly, it is knowledge generated by research centres, as the basis for the implementation of new solutions by various organizations in the field of technology or management. In Poland, however, advantages of this type of linkages and opportunities for mutual learning are not recognized [7]. The second type of knowledge is related to access to best practices (benchmarking), i.e. an opportunity to learn from market leaders, and an opportunity to use knowledge accumulated by the cluster participants in order to represent the interests of the group operating in a given market.

## 2.2 Centres of innovation and entrepreneurship in Poland

A separate group of institutions with which companies can work together to raise their competitiveness are centres of innovation and entrepreneurship.

Support institutions can be classified: according to a variety of tasks undertaken, target groups of recipients of services or personnel competencies needed.

1. Centres of entrepreneurship – extensive promotion and incubation of entrepreneurship (often in discriminated groups), provision of support services to small companies and promoting the development of peripheral regions or regions affected by structural crisis;
2. Centres of innovation – extensive promotion and incubation of innovative entrepreneurship, technology transfer and provision of pro-innovative services, activation

of academic entrepreneurship and cooperation between science and business;

3. Financial institutions – facilitation of access to financing newly established companies and small companies with no credit history, provision of financial services tailored to the nature of innovative economic ventures [8].

**Table 2.** Classification of centres of innovation and entrepreneurship

Centres of entrepreneurship	Financial institutions	Centres of innovation
training and consulting centres, centres of entrepreneurship, business centres, business clubs, consultation centres, consulting and advisory centres, pre-incubators, business incubators	regional and local loan funds; Credit Guarantee Funds; seed capital funds; Business Angel Networks	Technology Transfer Centres; Academic Incubators of Entrepreneurship, Technological Incubators; E-incubators; technology, science, research, industry and technology parks, technopoles

Source: Bąkowski, A. & Mażewska, M. (2012). *Ośrodki innowacji i przedsiębiorczości w Polsce Raport 2012*. Warsaw: PARP p. 25-43.

From the beginning of the transformation, the number of centres of innovation and entrepreneurship has been steadily growing (except for the period 1998–2000) and in mid-2010 it reached 735. On the basis of a re-verification of the number of support institutions performed in 2012 (last research) in the form of surveys and telephone interviews, it was evaluated that there were about 820 active centres.

These can be divided into the following groups:

- 43 technology parks,
- 23 technology incubators,
- 24 pre-incubators and academic business incubators,
- 46 business incubators,
- 69 technology transfer centres,

and seed capital funds, business angel networks, local and regional loan funds, credit guarantee funds, training and consulting centres and information centres.

Science and technology parks

The so-called Lisbon Agenda adopted by the European Union pointed to the need to transform the EU economy so as to make it more competitive. For this purpose, a number of tasks were undertaken to guarantee the achievement of this goal. It soon turned out that these actions were too dispersed and as a result the EU economy was not as competitive as expected. Therefore, in the next strategy, Europe 2020, it was established that all efforts should focus on acceleration of growth and an increase in the number of new jobs. However, as it was emphasised, in order to accomplish these tasks, it is necessary to recognize the importance of knowledge management in business processes, because knowledge is a resource which initiates entrepreneurial and innovative behaviours, and hence determines the emergence of new technologies, which can be a sign of competitiveness. As the experience of highly-developed countries shows, activities related to the treatment of knowledge as a particular type of resources and development of innovation are characteristic of science and technology parks. Institute for Market Economy Research gives the following definitions of science and technology parks:

- a. according to the Act on financial support for investments)

A technology park is a cluster of separate buildings together with technical infrastructure, created with the aim of attracting a flow of knowledge and technology between scientific entities and enterprises. Entrepreneurs using modern technologies are offered consulting services in the formation and development of enterprises, technology transfer and conversion of results of research and development work into technological innovations. Entrepreneurs are also offered an opportunity to do business, using the buildings and technical infrastructure based on a contract.

- b. according to the International Association of Science Parks

A slightly different definition is suggested by the American Association of University Research Parks and the Association of British National Parks. According to these organizations, a park is usually owned by a university or is managed by it under a relevant contract, the grounds and buildings are owned by private individuals or private research institutions. The purpose of this park is to promote and oversee joint activities aimed at supporting new enterprises or ventures [9].

In addition, the role of parks involving creation of conditions for effective technology transfer and stimulation of the development of innovative enterprises is implemented mainly by using skilfully selected elements of support infrastructure in the form of:

- scientific research centres offering new technological solutions and innovative companies looking for new development opportunities;
- wide business environment in terms of financing, consulting, training and support of the development of innovative companies;
- financial institutions of high risk (venture capital);
- high-quality infrastructure and environmental values;
- high-potential entrepreneurship and business climate attracting creative people from other regions;
- governmental, regional and local programs to support entrepreneurship, technology transfer and the development of new technology companies [10].

It can, therefore, be assumed that a science and technology park is a kind of cooperation between science (research) and business (industry).

The following reasons for the selection of a science and technology park are most frequently mentioned:

- lower cost of rent (in comparison with the market costs),
- favourable location,
- brand of the park (better promotion of the company, increased credibility of the company);
- opportunities for cooperation (exchange of experience) with other enterprises hosted in the park,
- opportunities for cooperation with academic community,
- provision of additional services (e.g. accounting, legal),

- assistance in setting up a business,
- access to specialist services (e.g. technology consulting) [11].

It is confirmed by Polish entrepreneurs. The results of studies conducted by PARP [12] show that when making their decisions about the location of businesses, entrepreneurs were driven by the following factors:

- a. rental price of a plot or real estate (58% of responses),
- b. favourable location of the park 46% of responses),
- c. offer of the park (23%),
- d. possibility of cooperation with other tenants (21%).

Moreover, entrepreneurs' expectations from science and technology parks include:

- assistance in obtaining funding, research grants (45%),
- provision of counselling services (42%),
- organization of training (26%) [12].

It should be emphasised that science and technology parks offer a very interesting and wide range of training courses for the hosted companies:

- access to European funds (85% of parks),
- entrepreneurship and formation of companies (85%),
- development of a business plan (85%),
- finance and taxes (73%),
- commercial law (73%),
- computer science (73%),
- information on technology and patents (54%),
- bookkeeping and accounting (46%),
- market research and marketing (46%),
- business management (46%),
- implementation of new products and technologies (39%),
- cooperation agency services (39%).
- quality management (39%) [13].

Moreover, science and technology parks support activities of young innovative companies which are focused on the development of products and production methods in high-tech industries. They also help in the creation of optimal conditions for technology transfer, and contribute to commercialization of research results provided by research institutions [14].

The oldest park operating in Poland is the Poznań Science and Technology Park, which provides a wide range of services to the SME sector:

- Centre of Advanced Chemical Technologies (it consists of: apparatus laboratory and Chemical Technology Incubator). The aim of the centre is "the development and improvement of existing technologies of synthesis of chemical compounds and troubleshooting of synthetic, technology and analytical problems for a variety of companies operating in the chemical industry." [15]
- Technology Incubator – offers assistance to new companies in the organizational phase, provision of counselling services in the field of marketing,

- market analysis, procedure of innovation implementation;
- Innovation Support Centre – its purpose is "to promote the participation of R&D sector and enterprises in the EU Framework Programmes, support the process of technology transfer from the sphere of research and development to the sphere of small and medium-sized enterprises on the regional, national and European level, and between enterprises; promotion of widely understood innovation; streamlining of the flow of information from science to economy; participation in the construction of Regional System of Innovation; support for the creation of knowledge-based enterprises." [15]
- Poznań Radiocarbon Laboratory- (performs measurements with the most modern technique of accelerator mass spectrometry (AMS), is the first unit of this type in Central and Eastern Europe);
- Centre of Analysis and Medical Diagnostics- (activities are focused on heart, hearing, sight diagnosis);
- Centre of Applied Informatics- (research, implementation and training in the field of ICT and high technology; consulting and obtaining domestic and foreign aid funds; support for the activities of the Computer Measurement Group Polska; promotion of cooperation between the academic community and commercial entities; organization of scientific events and conferences popularizing the goals of the Centre).

### 3. Results and discussion

Development plans of parks are inhibited by a number of barriers, which in the opinion of park managers indicate the continuing closure of the environment to commercial activities based on knowledge and arise from:

- legal restrictions and lack of procedures for technology transfer,
- lack of partnership and business-oriented cooperation with the scientific community,
- lack of funds for equipment and adaptation of buildings,
- reluctance of the scientific community to commercialize research results,
- lack of projects for commercialization,
- poor economic situation in the region,
- lack of market for modern/technological products and technologies,
- little interest in the offered services,
- lack of people willing to start their own businesses,

- academic grey economy,
- problems of cooperation with local and regional institutions,
- tight organizational framework and requirements imposed by park organizers,
- poor location, poor accessibility,
- misunderstanding of the idea, hostile climate around the park.

Despite the reported difficulties, park authorities see opportunities and potential for development.

### 4. Conclusions

The level of innovation of economies of individual countries, regions or enterprises is a determinant of their competitiveness. Innovation is one of the factors determining the development of an organization. The above-mentioned various forms of cooperation between enterprises are a proposal for seeking new development opportunities. Cooperation with other companies, research centres or universities provides entrepreneurs with easier access to knowledge and technology. Their use at the level of an enterprise can improve productivity, extend the product life cycle, expand the product range, facilitate innovation and thereby strengthen the market position and allow expansion into new markets.

Implementation of innovative activities depends on many factors. Entrepreneurs should learn to "read" signals coming from the broadly understood market and adapt their enterprises accordingly. However, it is usually difficult to introduce changes in an enterprise, therefore it is necessary to create a kind of pro-innovative organizational culture composed of, among other things:

- clear and transparent incentive system to promote persons who study, improve their skills, are hardworking and ambitious;
- leaders who are not afraid to educate their successors;
- acceptance of changes and a process of continuous improvement;
- widely known, understood and accepted system of knowledge management;
- mutual trust of employees;
- i.e. elements that create an innovation-friendly atmosphere.

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