

NEW APPROACHES ON INNOVATION PROCESS IN THE CONTEXT OF KNOWLEDGE-BASED ECONOMY. IMPLICATIONS FOR ROMANIAN ENTERPRISES

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Abstract

*In the knowledge-based economy the knowledge has become the essential factor of production, the key element of economic competitiveness at the organizational level, national and global level. Education, research and innovation form the so-called "knowledge triangle". In this triangle, the **innovation** is the key element with the greatest impact on welfare and also the most problematic in terms of the related policies.*

*Unfortunately, most of the Romanian enterprises, especially the small and medium sized ones, have not the resources to support innovation process. For this reason, it was found that a viable innovation strategy is based on the combination of firms, participation in networks, alliances and collaborations in order to reduce costs ever higher of technology transfer. In recent years, such a combination is the **business cluster**.*

Starting from these considerations, the paper presents several aspects regarding the clustering process, as the best way of achieving competitiveness for Romanian enterprises, especially for the small and medium ones. The paper also highlights the main benefits of the clusters parts.

Key words: the knowledge-based economy, knowledge triangle, innovation system, business clusters, Romanian enterprises

JEL classification: M21; O32;

INTRODUCTION

Today humanity is experiencing a period of transition from an economy based predominantly on material resources to the knowledge-based economy. In this new type of economy the strategic role return to intangible intellectual resources, to knowledge acquired and their use and not to material factors of production.

We can say that **the knowledge** has become the essential factor of production, the key element of economic competitiveness at the organizational level, national and global level.

Currently, the countries of the world and most organizations are aware that the generation and exploitation of knowledge are essential factors, vital sources of global wealth growth. Consequently, a major concern for both organizations and for countries, especially the developed ones, is the systematic generation of knowledge through the development of the national and international interactions, more sophisticated.

Education, research and innovation form the so-called "**knowledge triangle**". In this triangle **innovation** is the key element with the greatest impact on welfare and also the most problematic in terms of the related policies. All experts agree that innovation is a complex process with many variables, which is based on collaboration between research and industry. To help improve well-being, developed countries have sought solutions, proposing forms of interaction and collaboration more complex in

order to create bridges between the two sectors and allocated in this regard, public finance more substantial.

In the context of global dynamics, key actors present in the analysis of innovation are U.S.A, Japan and the European Union. Speed and efficiency with which the innovation diffusion occurs in the economy is critical to productivity and economic growth achieved since the initial innovation is developed after it found a practical application in the economy.

At European level, strategic planning in innovation area is a traditional approach. In the context of discussions about the knowledge economy, more than 150 euro-regions have enjoyed the projects of the European Commission having proposed the development of innovation strategies. EU strives to catch growth to the United States, placing the research - development - innovation (RDI) for such actions. Review of the Lisbon Strategy in 2005 reinforced the Barcelona target of 3% of GDP allocated to research and development. Most European countries have already joined this goal without knowing exactly what will be the private investment level. Currently, the main challenges that European Union must face in order to improve innovation capacity are related to impaired concentration centres of excellence able to compete globally, poor integration of the elements of the knowledge triangle, renal trans and interdisciplinary research focused on the needs of innovation, lack of organization and governance models for research and education at the European level, the high cost of patenting in the EU and the low mobility of researchers.

Starting with Lisbon Programme, the European Union launched for 2007-2013 a set of initiatives regarding research and innovation, global competitiveness of universities and research institutes, entrepreneurial skills development and transfer of knowledge into products and services. European Union Framework Programme for Research and Technological Development for 2007 - 2013 [3] continue to be conducted rhythmically as planned, representing an alternative source of funding for institutions and Romanian economic operators. Most European countries, particularly the EU, have developed programs concerted exit, considering the RDI as a priority and avoid reducing financing, together with coherent measures of economic, financial and tax.

Romania also has drafted the National Strategy for Research, Development and Innovation for 2007-2013, [12] thus stimulating the development of research in our country, area deeply affected by the economic crisis began in late 2008. Romanian companies have understood that in the knowledge-based economy, innovation in the production of goods and services is the key factor that increases competitiveness. Unfortunately, most of the Romanian enterprises have not the resources to support innovation process. For this reason, it was found that a viable innovation strategy is based on the combination of firms, participation in networks, alliances and collaborations in order to reduce high costs of technology transfer.

The enterprises can achieve in this regard various types of RDI agreements directly with research institutes, universities, other organizations, public-private partnerships, which may be different, depending on the financial contribution of each, the type of protection taken etc. In recent years, such a combination is the **business cluster**. It can be considered as the best way of achieving competitiveness for Romanian companies, especially for the small and medium ones.

Starting from these considerations I will present further some aspects regarding the new approach of the innovation system nowadays, showing the importance and advantages of clustering for promoting innovation. Also I highlighted the benefits of clusters for Romanian enterprises.

THE NEW MODEL OF INNOVATION IN THE CONTEXT OF KNOWLEDGE-BASED ECONOMY

Michael Porter has shown in his book *"The competitive advantage of nations"*, that in order to explain the economic success of a country or region is not sufficient to use the classical theory of production factors. This success depends on a complex interaction of factors, which later, were grouped in the so-called **"The Porter's Diamond"**: demand, business strategy and competition, factors of production, supply chains and horizontal integration. [11]

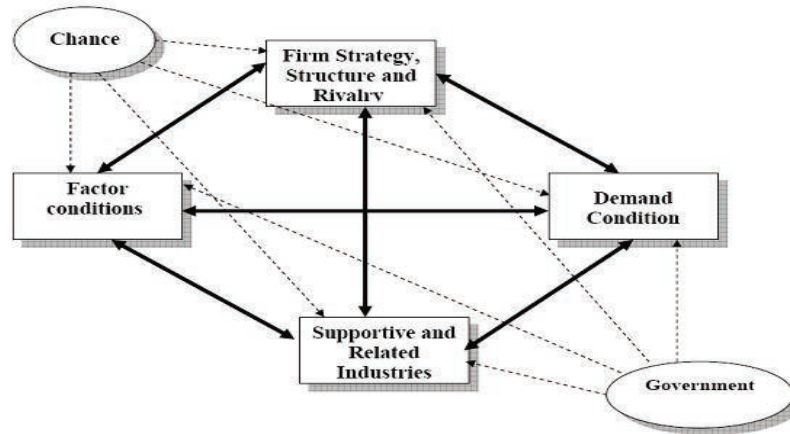


Figure 1. "The Porter's Diamond"
Source: Porter, M. (1990) [11]

We all agree that innovation is now a sine qua non condition for economic success and for maintaining market businesses. Much time and unfortunately still today, innovation has been seen as a linear process: invention - prototype - testing - mass production - market. This model, which attracts by its simplicity, nowadays seems outdated. Innovation is considered today a complex, nonlinear and systemic process, based on the interaction of actors in innovation systems. Essential contributions to the innovation system approach has had Lundvall [5], Nelson [8] and more recently Guth [4].

The **"New Diamond of Innovation" Model** was developed by GUTH, M. [4], taking into consideration "the competitive advantage theory" of PORTER.

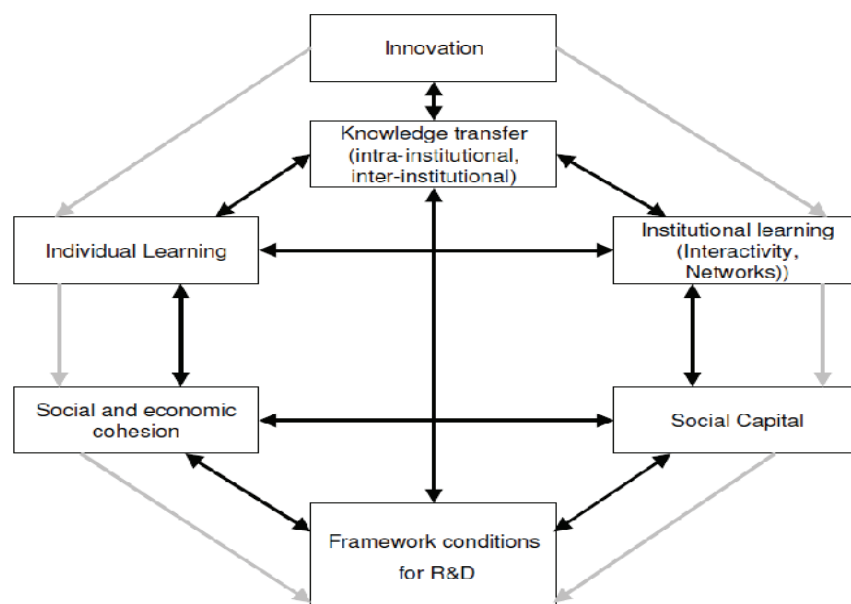


Figure 2. The "New Diamond of Innovation" Model
Source: Guth, M. (2004) [4]

This new model is based on the individual and institutional learning concept. The individual and institutional learning may take place if it is set as a common set of norms, rules and principles. Innovation process is based on scientific knowledge, supported by a modern infrastructure. Also, the model shows that the technological transfer processes and innovation cannot take place in a polarized economic and social environment. A condition for the implementation of the innovative processes is represented by the economic and social cohesion.

INNOVATIVE CLUSTERS – A STRATEGIC PRIORITY FOR SUCCESSFULLY PROMOTING OF INNOVATION PROCESS IN ROMANIAN ENTERPRISES

The cluster concept

Fundamentals of business cluster concept were made in the nineteenth century by Alfred Marshall, in his "Principles of Economics" in 1925. He showed that a geographical concentration of a certain industrial sector shapes the specialisation of the suppliers. [6] He identified three reasons for which the companies in closer proximity are more efficient than others which act at distance from one another: labour force basin; supplier specialisation; know-how transfer. [6]

Over time the cluster concept has evolved.

Michael Porter is considered to be the inventor of the "cluster" term. According to his conception, the cluster is *"a geographical concentration of companies and institutions in interconnection from a certain economical field"*. [9] [10]

There were many other approaches on cluster concept [14] [15].

Today we can talk about the new paradigm of cluster, called **"Triple Helix Model"**. [2] According to this model, the cluster comprises three categories of actors:

- **universities** and research institutes that are suppliers of innovative products, technologies, processes and services;
- **industry**, especially SMEs which represent the innovation demand and they should determine and absorb the offer from research institutes;
- **authorities** (ministries, regional authorities, etc) which are responsible for the process facilitation.

Experience has shown that in Romania the three components do not cooperate because they do not know each other very well. Therefore, experts felt the need to adapt this model and transforming it into another model with four components, called the **"Four Clover" Model**. The fourth actor is **the catalyst organizations** - consulting firms specialized in technology transfer and innovation, technology transfer centers, etc. [1].

When we talk of clusters, it is not important the size class of enterprises in the particular field, but are important trade relationships that occur both within the field and beyond. Today, there is a wide variety of clusters that can vary according to several criteria: specialization in a particular stage of the value chain, geographic location, meets certain needs of customers or serving certain market segments etc.

The most important clusters are **"the top-level clusters"** or **"innovative clusters"** that have a major impact on the competitiveness of a country, and they are supported at national level to achieve the level of international excellence.

Innovative clusters are polarized around innovative companies and research organizations that are designed to stimulate innovative activity by promoting intensive interactions for promoting research results through sharing facilities, expertise and knowledge and through concrete activities for technology transfer.

Significant impact on the enterprises development and competitiveness have the **regional clusters** also. Although their importance may not exceed the boundaries of the

region, they are funded at the regional level and have the potential to reach the rank of top-level clusters.

In the EU the focus is on the development of clusters in the first category "the top-level clusters", because the EU needs innovation champions to internationalize rapidly, and the cluster is an environment for innovation.

In order to monitor the phenomenon of clustering, the European Commission established in 2006, the institution called "European Cluster Observatory" [16] which provides quantitative and qualitative statistical data on the situation of clusters in Europe. Currently "European Cluster Observatory" develop a platform for online collaboration between clusters and members of clusters (intercluster Europe), allowing them to relate and have easier access to a range of information.

The benefits of innovative clusters for Romanian enterprises

Innovation requires knowing the market trends and even anticipate them and at the same time requires quick reaction to change and flexibility for change. To start a new business or to develop an existing business it is required the identification of specific needs unmet or poorly met, the existence of feedback and analysis.

Because we already live in an interconnected world where the access to information (especially to specialised information) is vital, networking has become a necessity for companies, especially for small and medium size enterprises. Networking between large companies and small and medium size enterprises (SMEs) are an opportunity to have access to information and to the exchange of information in a timely manner and without high consumption of resources. Networking is a starting point for most of the clusters initiatives. Clusters provide an environment where economic agents can exchange information with other partners in the cluster. However, today's business world shows that a successful business is increasingly dependent on an environment that fosters cooperation and innovation.

In this context, we can say that for Romanian enterprises clustering is a source of competitive advantage. Business clusters are considered today a strategic tool that enables businesses, especially those in the SMEs, to be competitive both nationally and internationally. This is because the main objective of any cluster is to achieve competitiveness and economic performance.

One of the indicators of the performance of a cluster is the *result of innovation* [9] which is defined using other several factors: the number of patents, the growth rate of start-ups, venture capital investment value, the number of newly listed securities or the number of companies in the cluster that have the power to occupy a relevant position globally. Factors determining the performance of a cluster are numerous [1], [17], [18] but I think the most important are:

1. Access to specialized knowledge and technologies

The new model of values in the cluster is based on the specialized knowledge and technologies that give the unique character for the cluster. A firm acting alone, especially the SMEs, would not have access to such knowledge and technologies to support innovation.

According to knowledge management, cluster performance will be measured using the degree of ensuring specialized knowledge and their quality, and also how to create new knowledge. This is achieved through close collaboration between R & D institutes, universities and other organizations within the cluster. Also the clusters improve innovation process and technology transfer process. Thus, it is possible to define new standards, to transfer technology and to improve manufacturing process.

Technology transfer is the transfer of knowledge used in the production of goods and provision of services, enabling companies receiving this knowledge to improve their respective products or services and to be more competitive in the market. In the

case of clusters, the process can be considered essentially a connection and a technological cooperation between the firms in the cluster, providing or receiving knowledge. Thus, a transfer of intellectual capital and know-how can occur between organizations in order to develop and to marketing the products and services belonging to the enterprises in the cluster.

2. Access to specialized human resources

We all know that at the organizational level, human capital is a critical source of competitive advantage, a determinant of the competitiveness of the organization.

Human resources, along with the material, financial and informational resources represent the resources system available to the company. [7]

Unfortunately, most of small and medium enterprises in our country show a lack of resources, facilities and technical knowledge. Faced to the environmental challenges the large enterprises respond by their ability to reduce costs (as a result of economies of scale), by supporting expensive research and development programs, resulting in technologies or products, but small and medium-sized enterprises don't have these possibilities. Even if they have the advantage of higher flexibility and adaptability, these firms are vulnerable to the challenges and demands of today's business environment, an environment characterized by trends of regionalization and internationalization of business and, in recent times, dominated by the global economic crisis.

Under these circumstances, how can SMEs to obtain or to maintain competitiveness using human capital as a source of competitive advantage?

Integration within a cluster can be a possible solution because the cluster is carried out continuously many specialized processes related to human resources, and these processes are generating performance. These processes include: identification of individuals with special skills needed for innovation process, and thus for the innovation result of the cluster, through a continuous process of recruitment of specialized human resources; continuous training and practice of a specialized training that is a key condition to strengthen and develop the cluster and is supported by both businesses and specialized institutes. Thus, the cluster reaches have experienced staff and specialists in certain areas, which gives a certain stability of employment and even better division of tasks; development of a new organizational culture suitable to innovation, a culture that goes beyond the borders of enterprise and is based on certain values of which the most important is innovation.

Therefore, the cluster can be considered a source of skilled labour force, having a high mobility. Transaction costs for identification, selection and employment are relatively low because companies can easily find specialized human resources in the cluster.

3.Improving communication, sharing of strategic information

The main institutional factors that contribute to the performance of the cluster are: government, universities and the specialized research institutes, other collaboration institutes, enterprises.

The governments play an important role in encouraging and supporting of the clusters initiatives, through the policies that promote science and innovation and also local government. Government affects competitiveness by influencing business environment. Government influence positively or negatively, business environment and productivity cluster. The main role of government is to improve the business and not to intervene in the competitive process.

Universities and specialized research centres are forces that must underpin innovation. Institutes of collaboration are formal or informal organizations and networks that facilitate the exchange of information and technology, promotes different types of coordination and collaboration that can improve the business environment in

the economy or in the cluster, perform diagnostic tests on the competitive position of clusters, develop programs training and management, etc.

The enterprises play an important role, even a central role in the economic clusters. Enterprises in the cluster are characterized by the following roles: improve the competitive environment, communicate the requirements of local universities, research institutes and training centres, actively contribute to cluster development activities, actively participating in cluster activities to identify new opportunities for collaboration, contribute to programs that support new enterprises etc.

Any successful business requires detailed information to improve the quality of competitive strategies and to make the management more flexible to the new demands of the international market. Improving communication between organizations in the cluster, due to proximity and increase confidence in other enterprises, is an important advantage offered by this type of organization. Exchange of strategic information is an advantage of the cluster, significantly contributing to the foundation of good business decisions.

4. Improving market access, especially external market access, reducing transaction costs and allocating shared resources

Clusters are crucial for market access, especially external market access, especially for SMEs. Small businesses can enter the domestic market, but only in very few cases they can be competitive in distant markets, if they are not part of a local network of complementary skills. Export group can enable companies to overcome individual limitations and to penetrate foreign markets.

By improving communication occur a decrease of the costs associated with the contracts and choice of business partners. Also, clusters facilitate specialization and effectively help entrepreneurs to invest little by little, depending on available resources and skills. Thus, in some associations formed within the cluster can develop strong relationships with financial institutions. The cluster demonstrates that competing organizations can collaborate if they find a way to mutually beneficial cooperation based on the principle of "win - win".

All the factors listed above that determine the performance of a cluster can be considered *endogenous benefits* of the cluster, with positive effects on businesses and on the field in which they are part. These benefits can be coupled with a number of other benefits, which we call *exogenous benefits*, and that contribute to the attractiveness of the region and to the regional growth. These advantages include: encouraging direct investment flows, creating new business, creating new jobs, the emergence of new human settlements, increase adding value etc. Therefore, clusters offer a number of advantages for the participating companies and for the region they belong.

CONCLUSIONS

As I showed above, Romanian realities require an adaptation of the Triple Helix model. It requires a fourth actor, **"catalyst organization"** that means consultants, technology transfer centers, commerce chambers designed to bring to "the same table" the other three partners, which don't works by itself. The "Four Clover" is already successfully applied in Romania in clusters or potential competitiveness poles such as "Dacia - Renault" in the automotive industry or "Pro Wood" in wood industry.

Participation in a cluster is beneficial to enterprises, from several points of view:

(i) the "young" companies have the chance to learn from the experienced enterprises, participating together in outreach, training, marketing, purchasing fixed or mobile, producing and selling together, building common infrastructure;

(ii) the cluster has a flexible organization, each company performing certain activities according to market demands and cluster strategy. Thus, we can say that the cluster is also ideal to present a lot of companies under the same brand, marketing under a common policy, to harness resources and competences;

(iii) the clusters have the potential to increase added value more than isolated enterprises.

In conclusion, we believe that in today's world of business that is dominated by change and ravaged by the global economic crisis, clusters may represent a possible solution for increase competitiveness and economic performance. We also believe that clusters are the solution for many SMEs to achieve technological progress and to reduce operating costs and distribution costs. In a holistic approach, clusters represent a specific organization type that facilitates the crystallization of a new investment policy geared mainly towards shaping a competitive advantage based on knowledge. In Romania, there is no a cluster strategy and an action plan in this regard. There is only a cluster policy that is part of Industrial Policy of Romania (2010-2013), in line with the Europe 2020 strategy. [13]

Research conducted so far has shown that our country took shape clusters in areas such as software production, shipbuilding, wood, textile, ceramics. [1]

BIBLIOGRAPHY:

1. COȘNIȚĂ, D., GUTH, M. (2010). Report on the Cluster Mapping Results. Bucharest: Romanian Ministry of Economy and GTZ.
2. ETYKOWITZ, H. (2002), The Triple Helix of University-Industry-Government Implications for Policy and Evaluation, Stockholm.
3. EUROPEAN COMMISSION (2006), European Union Framework Programme for Research and Technological Development for 2007 – 2013: http://europa.eu/legislation_summaries/energy/european_energy_policy/i23022_ro.htm
4. GUTH, M. (2004), Innovation, Social Inclusion and Coherent Regional Development: A new diamond for a socially inclusive innovation policy in regions, Discussion paper on the Conference on Territorial Cohesion, Galway;
5. LUNDVALL, B.A., Ed. (1992), National Systems of Innovation: Towards a Theory of Innovation and Interactive Learning, London.
6. MARSHALL, A. (1925), Principles of Economics (8th Ed.) Macmillan, London;
7. MICULESCU, M. (2012), Economia și gestiunea întreprinderii, Editura Eurostampa, Timișoara.
8. NELSON, R.R., Ed. (1993), National Systems of Innovation: A Comparative Analysis, Oxford.
9. PORTER M. (2005) Clusters of Innovation, Council of Competitiveness, Washington;
10. PORTER, M. (1998), Clusters and the new economics of competition, Harvard Business Review; Boston; Nov/Dec;
11. PORTER, M.E. (1990), The Competitive Advantage of Nations, Free Press.
12. ROMANIAN GOVERNMENT (2006), National Strategy for Research, Development and Innovation 2007-2013;
13. ROMANIAN GOVERNMENT (2009), Industrial Policy of Romania (2010-2013).
14. STABER, U. (2001), The Structure of Networks in Industrial Districts, International Journal of Urban and Regional Research, Volume 25, Issue 3, p. 537–552;
15. STERNBERG, R.(2009), Regional Dimensions of Entrepreneurship, Foundation and Trends in Entrepreneurship, vol. 5, no.4, 211-340, Now Publishers, Inc., Hanover;
16. www.clusterobservatory.eu;
17. <http://www.cluster-research.org/gcis.htm>.
18. <http://www.inma-ita.ro/clustere/Ghid.pdf>;