

The Intelligence of Business System or Cluster.

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Abstract

Four main trends that are shaping the landscape of the battlefield in business and especially in manufacturing could be distinguished: the erosion of boundaries between the production and services, hyper-competition, innovation (with the growing emphasis on value innovation), and growing importance of networks and alliances. Coping with such complexity requires adequate managerial competence both on the company and network level. The article focuses mainly on network – cluster and business system - level because on the company level one can find a number of propositions for the company management could be find in the literature and business practice. Development of the collective competence of networked groupings of social and economic actors has received much less attention by the scholars.

The concept of an ‘Intelligent’ Business system or cluster has been employed. The concept of business system firstly has been introduced by Whitley (1992) and received further development in the works of other authors. In our article business system we understand as a certain mode of social and economic interactions of a number of networked actors in the process of value creation. Such business systems have their own internal structure, social values and culture.

Introduction

The development of any country or the region is based on specific resources, business models and has its own trajectory. While modeling the trajectory of the development it is important to understand the pattern and the model that has predetermined the current situation. The pattern of the development of new member-states of the European Union was similar and based rather on the same core elements (Ketels, 2006):

- Radical opening of their economies for the competition and foreign investment;
- Cheap labor force with high basic competence;
- Generally favorable system of taxation and sufficient infrastructure;
- Proximity to a highly competitive region: Scandinavia for the Baltic countries and Central Europe like Germany, Italy, and Benelux for the other group of countries.

This model still has some potential for the nearest future. However, it is of little help in a long-term perspective. Most of such countries suffer from inefficiency, losing the labor force due to the migration flows towards more developed countries. It is very likely that physical and institutional infrastructure for the creations of knowledge-based innovations will continue

to erode without a proper investment. To increasing the productivity and innovative capacity of businesses is a strategic challenge for most of the latecomer countries.

The aim for the article is to ground the approach to increasing the competitiveness based on two concepts - intelligence and business systems.

The concept of intelligence.

There are already in the management literature a number of different concepts, which attempt to capture the conditions for success in a knowledge economy, or the characteristics required of successful organizations, institutions or economic entities. These include: 'information society' (Radovan 2003, Grippenbergh *et al.* 2004, etc.), 'knowledge management' (Davenport *et al.* 1992), 'knowing organization' (Choo 1998, Rowley 2000, Stankevičiūtė and Jucevicius 2003), 'learning organization' (Senge 1990, Juceviciene, 2007, etc.) and 'learning regions' (Arbonies and Moso 2002, Jucevicius, 2007). In fact all of these, even if they do have application to a knowledge economy, have their limitations.

The concept of an 'information society' is mainly related to the use of information as a key asset. The problem with this concept is that individuals and organizations are becoming overcrowded with information that is not always of much use. IT tools have only a limited capacity to manage the information and, more particularly, to transform it into understanding. The gap between information and understanding is wide and full of complexities.

'Knowledge management' mainly deals with handling internal organizational knowledge, i.e. transforming implicit knowledge into explicit and storing, disseminating and using it. However, it is not easy to find cases where both internal and external knowledge are taken into account when developing knowledge management concepts and tools. The next step beyond the concept of knowledge management is the concept of the 'knowing organization' proposed by Choo (1998). He advocates using internal knowledge management tools by organizations for gaining awareness about what is happening in the environment and making sense of that. However, the main emphasis is still on internal issues.

The concepts of 'learning region' and 'learning organization' are based on two cornerstones: creating tools and preconditions for individual and organizational learning and developing learning partnerships and networks. Such qualities of organizations and other social systems are of crucial importance in the knowledge economy. However, although they serve as an efficient tool for the achievement of developmental objectives, they lack the content for such development.

The socio - economic environment is increasingly defined and described in terms of information. Managers and business leaders are being overwhelmed by facts and data. Often they are confronted with conflicting information and, instead of acting, they become paralyzed. While the external data storage capacity and data transmission speed have both increased dramatically over the past decades, the data storage capacity and data transmission speed of the human mind have stayed the same. In this situation people are making bad decisions and judgments simply because of inability to cope with data overload. The most advanced organizations understand that the key to success in today's environment lays not so much in knowledge as in 'intelligence'.

'Intelligence' combines many of the most important features of many other concepts. It is at the heart of a systemic and continuous process at strategic level dealing with the collection, *interpretation* and sharing of market-related, political, technological and social information in

order to assure developmental processes. Also, it is the art of monitoring weak signals which tell us whether the social system (institution, organization, region etc.) is on the right track or not.

The fundamental difference between intelligent and traditional organizations lies, however, in their time perspective. Traditional ones are focused on the present and have only a very limited perspective on the future. They start acting just after something happens and the signals from the market become clear for all players. In the meantime, intelligent organizations are trying to catch weak signals indicating trends and possible changes. They begin to prepare themselves to be ready to act when time comes. This allows them to acquire a competitive advantage. For example, it was not so difficult to foresee the decline of high-tech industry in the very beginning of this century if one understood the reason why the stock value of such companies had been over estimated. The textile industry is facing really big problems all around the developed countries because of globalization and pressure from Asian producers. Even if many companies are going to be closed, some of them are nevertheless expanding and expect to have a bright future. This is because they understood well the new rules of the game, anticipated the challenges, which were going to come, and took steps to adjust their products and production in ways which kept them competitive.

The same principles apply not just to a business or an organization but also to states (Jucevicius, 2007), especially when we try to answer the question: why do some nations advance and prosper, and what are their prospects for the future? If we look at the success stories of the most dynamic European countries in the last ten to fifteen years - countries like Ireland, UK, Finland, Sweden, Denmark - one could recognize the similarities between the developmental patterns of these countries. They show that capacity to generate intellectual capital - knowledge, information, intellectual property together with experience and the *ability to use them* in the most efficient way - are probably the most important preconditions of success in the knowledge age.

This capacity to discern a changing environment at an early stage, anticipate its significance and adjust, ahead of the field, to its new requirements could be called the *intelligence* of the state or an organization.

The concept of intelligence, as applied here, extends beyond management practices and economics. It sees the world as a shifting variety of social systems and each system as a communication network with its own 'personality' and culture, interacting in a variety of ways, and exercising its intelligence function in the service of its goals (Dedijer 1993). Understanding how to develop an intelligent institution is becoming one of the priorities for researchers in many fields of social sciences. Most attention has so far been paid to this concept in the business world (Bernhardt 1994, Ettore 1995, Fuld 1985, 1995, Herring 1998, Quinn, 2005, Sutton 1998, Underwood 2002, Yangblood 1998). The authors focus mainly on issues of business intelligence or competitor intelligence, trying to develop tools and approaches, which will allow a company to preserve its competitiveness. Dedijer (1993), Jequeir and Dedijer (1987), De Luca (1988), Toffler (1991) and others stress the technological and social aspects of intelligence. Beal (2000), Choo (1998) and Friedman (1997) focus on organizational learning as the key characteristic of intelligence in an organizational setting. My own experience in developing intelligent organizations in Lithuania confirms that both qualities are interrelated. Both require not just individual knowledge but also organizational knowledge and well developed internal and external networks and supporting infrastructure. Organizational intelligence refers therefore to many more than just intellectually competent individuals. Moreover this notion of organizational

intelligence can be applied at every level from the small business to the community, region or even country.

Intelligence of organization or of the business system/cluster can be defined as capability to adapt to the changing circumstances in order to achieve the preferred development objectives. A nation can hardly be classified as intelligent purely on the basis of traditional indicators of growth like GDP, manufacturing output or others. In the knowledge and information society, new indicators, such as the quality of life, environmental concern, freedom of expression and others should come into play. It has much to do with human intelligence, contemporary understanding of which extends well beyond abstract and verbal reasoning skills to embrace a spectrum of hard and soft dimensions. Gardner's model of human intelligence consists of seven elements: linguistic, intra-personal, logical, musical, inter-personal, spatial and bodily kinesthetic. As every organization or state consists first of all of organized individuals, all these elements could be attributed to them with some minor adjustments. For example, intrapersonal skills or ability to 'know oneself' matters at all levels – from an individual to the state. Self-awareness is a sign of social maturity. Ignorance of one's limitations can be fatal in a competitive business environment, both at the enterprise and cluster level. Sternberg (1990) argues that intelligence should be equated with mental self-government. This idea of intelligence as self-government capability comes from the Butterfield's theory that individual differences in intelligence have four bases (Cronin, 1993):

- Less intelligent people have smaller and less elaborately organized knowledge bases;
- They use fewer, more simple and passive information-processing strategies;
- They have poorer meta-cognitive understanding of their own cognitive systems and how the functioning of these systems depends upon the environment;
- They use less complete and flexible executive processes for controlling their thinking.

In the same way that psychologists speak of human intelligence, one could speak of the intelligence of a society. This type of intelligence could be called *social intelligence*. The concept of social intelligence is applicable to all levels, from an individual to the organized social or business systems. It is social in the sense that every social player depends on others for new knowledge. Interaction and exchange, direct or mediated, are social activities; acquisition, management and exhibition of intelligence are thus socially conditioned processes.

Underdevelopment is more a state of mind than a consequence of environment, social or technical impoverishment. This is not to deny that prolonged underdevelopment eventually leads to a deterioration of the environment, wastage of natural resources and a destruction of social integrity. However, the worst symptom of underdevelopment is the chronic inability of underdeveloped countries to cope with internal change (Cronin, 1993).

Many of the less developed countries do not know where they are going, or where they wish to go. The tools for the development often are copied from the countries with vastly different social and political histories, different contexts and the time. Too often it is assumed that tools, which bring prosperity to other societies, will succeed in a very different environment. The disparity in social structures, cultures and values, and ultimate goals is often ignored. Even when these tools and the economic objectives are compatible, they are not recognized as such by the underdeveloped mentalities, which have deployed them. Sometimes, however, the situation is the opposite: the 'uniqueness' of a single country is over-estimated and efforts are concentrated on creating 'unique' tools for such country or organization.

Less developed countries tend to lack knowledge - intelligence - about themselves, their friends and their competitors and about the technological, social, economic environment in which they have to compete. Very often developed countries and even multinational companies know more about these countries than the countries themselves. The less the developing countries know about a foreign investor's mindset, track record, investment policy or strategic intention, the more disadvantaged they are when it comes to rescheduling debt payments or negotiating royalties, licenses or preferential trade agreements.

All this is equally a truth while talking about the state, the region, industry, cluster or the company.

Clusters and business systems – a systemic tool to respond the new challenges.

Those two concepts are rather close in their essence. However, the concept of a business system is broader than a cluster. A cluster might be considered as a special type of a business system.

M. Porter (1990) is generally referred to as the “godfather” of clusters. At the same time R. Whitley (1992) might be called the “godfather” of the business systems. He revealed the specificities of value creation in different industries that are determined by the variety of stakeholders in each industry, their culture, technology, type of networking, etc. However, the essence of business system can probably be best explained by employing the concept of *social systems of production* (Hollingsworth and Boyer, 1997).

The business system concept comes into some contradiction with the liberal approach concerning the coordination mechanisms in the economy. It is more European rather than American approach.

Few could argue that the self-adjusting market mechanisms are probably the most efficient as far as the use of economic resources is concerned. However, there are a number of arguments that markets not always are ideal mechanisms for coordinating transactions among businesses especially in the industries with very complex technologies (Campbell, etc. 1991; Hollingsworth, Schmitter, Streeck, 1994; Sabel and Setline, 1996, etc.). Of course, the size and the structure of national economy as well as the national context play an important role in establishing the coordinating mechanisms. For example, it is difficult to expect the French system of production to be applicable in the UK or Scandinavian contexts.

The business system could be understood as the way that different institutions, organizations or other structures of the state, the region or a particular industry are integrated into a social configuration of the value creation processes. A set of interrelations between buyers and suppliers, business companies and training institutions as well as administrative bodies and the whole range of other relations should be counted. Such a system develops its own culture, vocabulary and ethics.

Whereas the neoclassical paradigm assumes that individuals are sovereign, Hollingsworth (1994) argues that individual action is influenced by the hold that institutions have on individual decision-making. It certainly is not about administration or other sort of bureaucracy but about recognizing the benefit of being a part of something bigger. Such coordinating mechanisms with a prevailing self-coordination allow such a social configuration to be more survival in a turbulent environment and to be more effective.

A variety of business systems might be observed on all levels. However, the essences of all of them are about the same and reflect the way all actors interact in pursuing their own goals. Because the idea of this article is to discuss the possibility of developing a collective knowing or intelligence in a business system, one of types of such systems might be taken as an example. A special type of a business system is cluster. Not all business systems are like clusters but every cluster that has achieved a certain stage of its development is a business system. Clusters are taken as an example because of already existing good knowledge and understanding about different aspects of this phenomenon.

During the 1990s, a true explosion of specialized and popular literature on the industrial clusters gave them an unprecedented coverage across a wide range of areas, such as business management, economic sociology, political economy, economic geography or industrial and innovation policy. There was also a degree of confusion over what various authors mean – and do not mean – by the concept of industrial clusters. Despite numerous publications in the field, the answer is still not clear. Clusters and clustering have become one of the hot topics in the contemporary studies on competitiveness, industrial policy and regional development. Nevertheless, a commonly accepted definition of cluster does not exist. One can find different national interpretations of the ‘cluster’ concept. French literature features the term ‘local productive system’ (fr. *système productif local*), Italian literature – ‘industrial district’ (it. *distretto industriale*), German literature – ‘networks of competence’ (ger. *Kompetenz-Netz*). Researchers from various countries seek to discover the presence of cluster-related structures and their regional specificity. Various aspects of industrial clusters were analyzed by Camagni (1991), Sternberg and Tamasy (1999), Etzkowitz et al. (2000), Lawton Smith and de Bernardy (2000) and others. But probably the most fundamental work that aroused interest in the concept was that of Porter (1990).

Innovation dynamics, knowledge creation and sharing in clusters are discussed by Morosini (2004), Lorenz (1992, 1996), Lawson (2000), Lawson and Lorenz (1999), Keeble and Wilkinson (1999), Santisteban, (2006) and others. Porter (1998), Morosini (2002) and Rabellotti (1999) try to understand the binding forces of clusters. An important feature of every cluster is geographic proximity of its actors. This aspect is discussed in the works of Porter (1990, 1998), Morosini (2004) and others. Despite a large number of studies published, many questions on the phenomenon of clusters and related forms of industrial cooperation remain unanswered.

In spite of the questions relevant to the actual scope of the knowledge economy, it is generally agreed that it affects most of world’s economies, though to a varying degree. All actors need new strategies and methods for dealing with this new reality. However, first of all, one needs a better understanding of the nature of processes taking place in the global arena. Two aspects of the new understanding will be discussed in the article: challenges of the growing complexity of business environment and the concept of the intelligence cluster as a special kind of business system.

Clusters as complex adaptive systems having a potential to challenge the complexity are well presented in the works of Rullani (2001). Nevertheless, this aspect of the problem has not received broader attention of other researchers.

There are a considerable variety of definitions of clusters in the literature. Porter (1990) says that a cluster consists of industries linked through vertical or horizontal relationships. Rabellotti (1999) describes the type of clusters found in industrial districts as being comprised of:

- Spatial concentration of enterprises;

- Socio-cultural ties amongst local economic agents, creating a common code of behavior;
- Intense vertical and horizontal linkages, based both on market and non-market exchanges of goods, services, information and people;
- A network of public and private local institutions supporting the enterprises in the district.

The working definition of clusters used in this article is as follows: *a socio-economic entity characterized by a social community of people and a population of economic agents localized in close proximity in a specific geographic region. Within an industrial cluster, a significant part of both the social community and the economic agents work together in economically linked activities, sharing and nurturing a common stock of product, technology and organizational knowledge in order to generate superior products and services in the marketplace.*

Industries and firms within a cluster can have either direct interrelationships or indirect common resource needs that support their competitiveness on national and world markets.

Why do clusters need intelligence?

The ultimate goal of industrial clusters is to generate superior products and services that are valuable to customers in the marketplace. According to Morosini (2004), there are at least two crucial points to be made about this notion. First of all, although an industrial cluster might benefit from some protective measures at the outset, in the long run the selection mechanisms that reflect the dynamics of business competition must be put in place. Otherwise, an industrial cluster will simply not survive, or it will do so as a result of economic transfers that are not necessarily market-related, e.g. in the form of state subsidies or fiscal incentives.

Secondly, industrial clusters have not only proved successful at creating real economic value nearly everywhere, but have also – during the second half of the 20th century – emerged as formidable global players in their own right across variety of industries. Therefore, although these industrial clusters are tightly confined geographically, their scope of competition is *increasingly global*, not local. The global scope achieved by industrial clusters during the 1990s went far beyond the export potential and international appeal of a specific product range that in the past typically made the fortunes of industrial clusters. At the dawn of the 21st century, industrial clusters were taking over entire areas of many global industries, such as manufacturing, R & D and product design. As a result, leading multinationals in different industries increasingly use industrial clusters for their benefit. These multinationals would typically involve industrial clusters either as leading suppliers or as key customers and innovators in the key areas of their value chain. All this suggests that companies and their groups in a single country will be integrated into the global business systems no matter if they understand that and how to do it, or not. *The strategic question is whether to be a source or a part of partnership. And this is very much about the intelligence.* Emerging knowledge economy even sharpens the situation.

Knowledge economy is global and creates preconditions for global learning. Global economy, resources, channels and learning exist no matter if a country or a particular organization or the cluster is ready to participate or not. It forces changes in the collective mindset of the involved actors and quest for the new concepts for value creation and

prosperity. Kim and Mauborgne (1999) refer to this as ‘value innovation’. Value innovation means finding new and more effective ways of achieving target goals and enriches stakeholders by combining the existing and new knowledge about environment, technologies, interest groups, values, approaches and attributes of value. In a knowledge economy such ability of any organized business system is becoming probably the most valuable competence. One of most complicated problems for organizations employing such concept is - how to combine two opposite competences: the need for highly specialized knowledge in a particular field and ability to see a complex picture composed of the elements from different fields of knowledge. The time dimension also has to be taken into consideration.

Success of the cluster or the business system depends on the level of advancement of the most important systems that determine such success. Accordingly, there may be different types of intelligence: *political, technological, economic, business and management intelligence*. Such classification is somewhat relative, because it is very difficult to extract something “pure” from any social phenomenon.

Knowledge about the policy, intentions or behaviors of governments, political parties, national and international interest groups and institutions implies political intelligence. Problems posed by fluctuating financial markets, macro economic trends or unstable political conditions create the need for economic intelligence. Keeping track of innovative efforts and new developments requires scientific and technological intelligence. Competitor’s positioning and knowledge of customers and suppliers translates into market or business intelligence. Globalization processes, coping with property rights, norms and international regulations concerning investment, taxes, etc. require high quality legal intelligence.

Intelligence is an attitude, which not only provides knowledge, but spurs wisdom, because of its comprehensive view regarding the interrelationships of all aspects of business and, consequently, the behavior of entrepreneur, organization or cluster as a whole (Jucevicius, R. and Jucevicius, G., 2005). It generates a special kind of information product, which is content-specific and focused towards a decision-making situation and is highly evolved in terms of possessing considerably greater informative value than the original data extracted from the information sources. There is an essential difference between information and organizational intelligence as a quality or capacity of the cluster. Information can be considered as value-added pieces of knowledge through meaningfulness for specific person or organizations (Hedin, 1992). At the same time, intelligence is about having a skill of ‘guessing right’ based on information and organizational culture. An effectively performed intelligence function will work as an early warning system. Business intelligence stimulates action.

Managers and entrepreneurs trained to act on facts tend to discount the value of competitive intelligence because *it is not what has happened, but rather what might happen*. It is about the possibilities as to *how* and *what kind of* future might occur. In this case, the quest for facts hardly makes sense: *there are simply no facts about the future* – it has not happened yet. Nevertheless, the future can be quite knowable given a rigorous analysis of the facts (Youngblood, 1998).

An intelligent cluster can also be described as organized intellectual capacity of the business system to perceive emerging changes in the environment, as well as their reasons and effects for its development. Such cluster possesses effective mechanisms for creating new understanding, knowing and competence by integrating new knowledge with the intellectual capital of individuals, companies and institutions. Finally, it is capable of making and implementing decisions to achieve its goals by exploiting resources of all kinds in the most efficient way. Consequently, three interrelated subsystems of the intelligent cluster can be

distinguished: understanding the context, developing collective knowing and ‘making things happen’.

The intelligence function or understanding the context is based on establishing the mechanisms for getting the right information and developing the ability to combine it with already existing knowledge in different contexts. It requires ‘knowing what, why, how and who’. There is no necessity or even sense of trying to establish consensus throughout all actors in the cluster. The main reason is to accommodate the diversity of approaches, interpretations and to provide a cognitive space for its members to inquire experiment and discover. The principal activities are scanning of the political, technological, social, etc., environment, noticing what is behind and interpreting the consequences or challenges.

Productive knowledge creation represents the idea of the innovation processes inside the cluster. In order to govern the complexity, a cluster has not only to explore and capture what is new, but also exploit the knowledge of what has been learned. A well functioning cluster can be also characterized by the effectively functioning innovation mechanisms.

The mission of the decision-making subsystem is to connect internal knowledge with intelligence products in order to transform the knowledge into value. Both subsystems are rather well discussed in the literature on innovation systems and management.

The role of information technologies in developing intelligent clusters is crucial. Such technologies enable not only operation in a virtual environment, but also creation of virtual innovation environments. One of the key factors for success in the today’s environment is ability to use global resources faster and smarter than competitors.

Three *core components* of intelligent clusters with regard to knowledge can be distinguished using the Komninos (2002) concept of an intelligent city.

First, *smart communities* serving as a heart of innovations, in which government, business and professionals understand the potential of knowledge and ICT and make conscious use of that knowledge and technology in order to improve life and productivity in their region. This component is a reference point for intelligent clusters or even the whole region. Probably the most simple and commonly accepted forms of such cluster-based communities are *technological* or *science parks*. These forms only have potential for becoming a smart community, but they do not necessarily realize this potential. The main precondition for success is the existence of a true community of people, scientists and producers who operate in an environment characterized by the social relations that transform scientific knowledge into new products and where a constant renewal of production processes and exchanges takes place.

The second component of the intelligent region or the cluster is existence of *virtual space for innovation* that combines knowledge management tools with ICT. This space can also be called a virtual innovation system. Komninos (2002) distinguishes two dimensions of such space or a system – knowledge management technologies and the information system for online operation of knowledge and innovation functions. The first dimension includes technologies and methods for innovation make up a part of the main innovation process supported by rules and conventions built on institutions that manage knowledge and technology flows. The second one is not just a simple projection of real functions into virtual space but also a radical reconstruction of those functions.

The third component of the intelligent cluster is the *processes of connecting the smart communities*, representing real innovation systems with a virtual space for innovations. It suggests the development of the processes, methods and technologies enabling to combine

the complexity of human interactions with creativity of human thought in handling the unexpected circumstances that do not follow the conventional logics.

Digital clusters are not necessarily the intelligent ones. However, the intelligent clusters are always rich with digital elements. This is so because of the nature of international competition that requires the ability to work in global networks and partnerships. Employing the intelligence approaches entails shifting of clusters and business organizations from competition to co-competition and using the resources of all parties involved. This is of extreme importance for the regions with limited resources and not only for them.

It is clear that science and technology acquire an exceptional priority in the competitiveness of cluster and the state as a whole. They have to shift from competition based on low-wage to technologically and knowledge intensive activities. However, the resources – technology, human capital and training – have to be adequate. The challenge comes from the technology gap between different business organizations and the lack of established structures of R&D and innovation system. According to Zitt (1999) low RTD intensity, over-representation of public sector, emphasis on basic research, low level of technology transfer and poor linkages to international R&D in innovation networks are characteristic features of less favored countries and the regions.

Given these conditions, some fundamental answers have to be found in developing the strategies for latecomer countries and less favorable regions. Should they adopt technological objectives similar to these of the leading countries, regions and business systems? Should such advanced technologies like nanotechnology, microelectronics, molecular electronics or cellular biotechnology be taken as a priority for the technological development? Or is it better to focus on the technologies appropriate for traditional industries? How to maintain the balance between these two alternatives?

Non-accessibility of new technologies is related to the fact that technology tends to become miniaturized or even dematerialized, especially in electronics and biotechnology. ‘Know-why’ becomes more important than ‘know-how’. ‘Reverse engineering’, as a way of manufacturing products similar to those available in the world market, which has been popular for decades and was successfully used by Japan and South Korea, becomes less feasible. The process of acquiring knowledge through technology use becomes difficult because technological development and further process of technological learning requires new skills.

A classical curve of product or technology adoption life cycle (Figure 1) can serve as a good tool for discussing the need and the role of intelligence clusters for national or regional development.

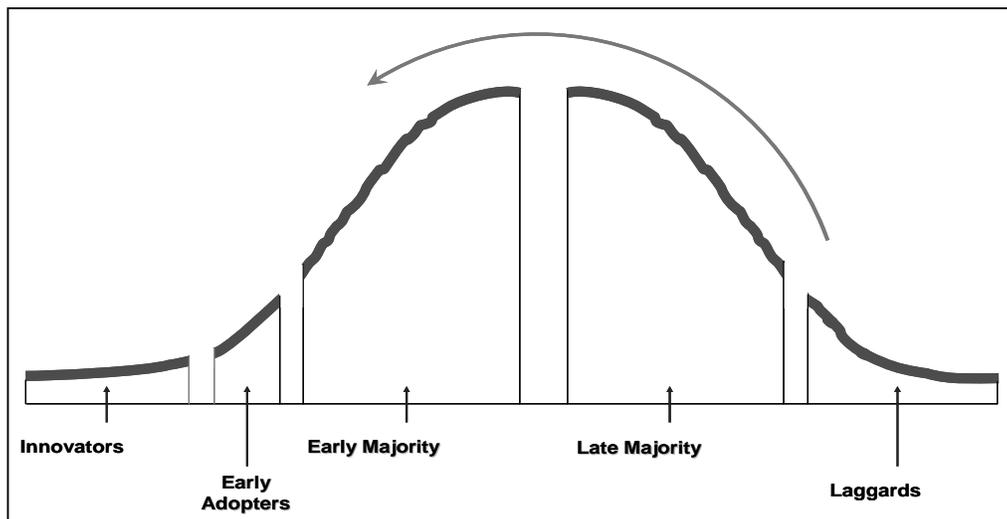


Figure 1. Technology life cycle

The idea of the curve could be best explained using an example of adoption of technology – or knowledge-intensive products. The behavior of individual buyers regarding the use of new products depends mainly on their psychographic profile – a combination of psychology and demographics that makes their marketing responses different from those of other groups. The behavior and ability to use new inventions in a particular field by collective users – organizations, companies, and institutions – depends mainly on the level of their socio-economic development, technologies and knowledge already employed. For example, *innovators* pursue new technology or knowledge products aggressively. They want to achieve competitive advantage by being first. Early adopters buy into new product concepts very early but, unlike innovators, they are not technologists. Rather they are people or businesses that find it easy to imagine and understand the potential benefits of a new technology or invention. The *early majority* is driven by a strong sense of practicality. They want to see well-established references before investing substantially (Moor, 1991). *Late majority* and especially *laggards* usually are not able to handle very fresh ideas or sophisticated products.

It is very important to understand that between any two groups of users there is some gap that reflects the difficulty a group has in accepting the same product. It may be due to the need for cognitive transformation (Delanty, 2001) or the economic reasons. Who are the innovators of a fundamentally new knowledge or technology? These are usually only the most advanced companies or other institutions that already possess adequate expertise. Normally, these are other research institutions. If an invention receives market development, it becomes a subject of interest for advanced companies or other well-established institutions and organizations. If it receives good reference and spreads in the market or other professional environment, it becomes of interest for a much bigger group of users. The price for such products becomes lower than that at the first two stages.

However, some fundamental questions need to be answered. First, what about the latecomer countries and the less favorable regions: are they able to invest into fundamental research? What is the structure of industry, science and technology development system in such territories? Will the national companies or other organizations be users of such inventions and products? The answer is almost certain - very unlikely. The question is not about the willingness to use it. It is related with two main aspects: first, usually such inventions do not correspond to current technologies and competences, and second, the fundamentally new

technologies require systemic changes in the entire company. These changes are related to large-scale investments, which are usually limited.

Second, is a single company able to succeed in ‘climbing’ the curve successfully or collective efforts are needed? Most industries and single economic entities in a less favorable country are placed on the second part or even at the end of the curve. One could not rule out the potential success stories by some specific companies. However, most businesses would find gaining the necessary competitiveness an extremely complicated task. Clusters or similar business systems could be of great use in this respect. It lies in the very nature of clusters.

The collective intelligence of the cluster can help the businesses inside that particular cluster to feel comfortably with respect to knowledge about their business environment, business development prospects, innovations in the field and other important aspects of business. As it has already been stated in the article, there are different facets of intelligence. In addition, some other elements of cluster intelligence system could be added.

Intelligence is first of all about trends in the macro environment, changing ‘rules of the game’, new inventions, politics and other global or regional processes that are important to businesses. It may be still a rare practice in small companies due to their limited resources and lack of competence. It could be a prospective business for a specialized professional company inside the cluster or accumulating the resources of cluster members could outsource the intelligence function.

The second layer of intelligence is industry. Three different industrial aspects should be covered by the intelligence activities: industrial sector, in which cluster is located, industry of suppliers and industry of customers. The last two groups of industries are very rarely subject to analysis even in the bigger companies. However, looking to business and management from the agility or other modern approach, strategically they are very important.

The third layer of clusters collective intelligence is a company level. Again three groups of interest to analysis and understanding could be distinguished: competitors, suppliers and customers. Collective efforts can be much more valuable and in certain cases – cheaper than those of individual companies.

If such a system of intelligence is effectively established in the cluster, this implies that the business system obtains an organized intellectual capacity to perceive the emerging changes in the environment, their underlying reasons and potential impact. This is a key feature of the intelligent cluster.

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