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REVIEW ARTICLE

DEVELOPMENT OF COMPETITIVE ADVANTAGE IN ENTERPRISES IN A KNOWLEDGE-BASED ECONOMY

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ABSTRACT

In the current market situation, running a business requires a constant search for areas in which one can gain competitive advantage, all the while consistently improving operations and demonstrating the superiority of the company over the competition. In a competitive market, the success of many organizations depends on their ability to adapt to constant changes in the environment. This is a necessity in order to survive and develop in a situation of ever-changing conditions and needs of the emerging market. Currently, the main characteristics of modern enterprises are organizations that quickly react to changes, have an innovative approach, minimize functional divisions; and invest in people and their professionalization. This paper is an attempt to show the mechanisms companies use to obtain competitive advantage in the market.

INTRODUCTION

Currently, modern enterprises are those that implement innovative technologies and tools to improve functionality throughout the organization and provide opportunities for collective learning in order to find new ways to solve problems (**Szymczak, 2013**). The search for new roads which lead to success and competitive advantage is becoming one of the main objectives of many companies. In addition, many enterprises have realized that under the conditions of growing competition in the global market, success does not depend on individual actions, but on the strength and dynamism of all partners who participate in delivering products to the end-user. Such thinking requires a completely new approach to cooperation among all the companies in a given logistics chain (**Kulińska and Ruth, 2013**). In order to keep afloat in today's market, companies are forced to anticipate and assess their own situation in real time. Factors such as the globalization of economic processes, volatility of the business environment, and the development of new technologies requires constant decision making. However, decision-making requires constant and rapid real-time access to reliable information. Information received in good time and of good quality reduces the risk in tactical, operational and strategic decision-making. The right information at the right time can make a difference in the development of the company and its position on the market.

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Accordingly, to maintain a competitive edge, the company is forced to seek competitive advantage not only in the material sphere, but also in the non-material sphere, where information processes play an important role. Without the use of modern technology, companies will not be able to meet the challenges they increasingly have to face.

MATERIALS AND METHODS

The aim of this work is to present the process of how competitive advantage is developed in the market. Attention is drawn, inter alia, to new dimensions of competition and obtaining business success in e-commerce. In addition, various aspects of human capital are pointed to as the main means of economic progress and modernity in the market. In this work, the methods used include a study of literature and source materials in electronic form, as well as observation and analysis of case studies.

The study method used was descriptive analysis based on extensive literature review. The theoretical achievements included Polish and foreign, mostly English-language sources, on the mechanisms of competition in a knowledge-based economy. The use of foreign literature was necessary because of the dearth of Polish studies on the topic. This enriched the arguments and discussion of new aspects, and allowed the presentation of the research problem in a broader perspective.

Competition in a Knowledge- Based Economy

A contemporary knowledge-based economy is an economy where the main component of business is the efficient control of processes and skillful management of people, utilizing their full potential. This is a structure in which the main problem is to understand how various mechanisms impact the transformation and development of the economy. Today's knowledge-based economy is regarded as a natural consequence of the evolution of the economic system, by virtue of the epic innovations that have appeared within it, and not as a collection of links existing in the economy disconnected from the functioning of the economic system. The knowledge-based economy is not an artificial structure, but a natural consequence of the development of the economic system. The knowledge-based economy has a huge impact on logistics and logistics management in organizations; it is the basis for the functioning of modern enterprises. It is extremely important at the strategic level and provides an infinite range of possibilities for the development of the organization.

The knowledge-based economy is focused on the use of intellectual capital, which is the knowledge and involvement of employees, with the help of modern technology, to generate, develop and apply innovation and improve the quality of human life, all the while achieving competitive advantage (**Poskrobko, 2011**). The contemporary dynamics of change in the market, fairly strong competition and rapid technological advances are forcing companies to be actively involved in the acquisition and creation of knowledge, as well as its utilization for innovation. Knowledge, technological progress, qualifications of company personnel, and the results of the use and development of innovation, are now becoming a source of long-term competitive advantage in the market and determinants of economic success in a globalized, knowledge-based economy (**Dolińska, 2010**). Knowledge is the overriding factor of production in this type of economy, meaning that the success of a company is determined by innovation (**Fazlagić, 2010**). Undeniably, the knowledge-based economy is based on the development of information technology, and reflects a much wider aspect of the changes resulting from the use of knowledge as a factor of added value (**Gardocka-Jałowiec, 2011**).

Increasing the value of the company is dependent on the efficient generation, acquisition, dissemination and application of knowledge. The development of enterprises, their growth in value, and improvement of their competitive position is less and less influenced by material factors and resources. Intangible resources are growing more and more important, foremost among them are technical, economic, financial and organizational sources of knowledge. This capital allows companies to create new technologies and products, facilitate the acquisition of new markets and improve the management of modern enterprises (**Staniewski, 2008**). It should be noted that in the modern world, value and efficiency do not depend on the clever allocation of scarce material resources, but on the size of a company's knowledge capital and its relevance, from the level of education of employees, to their ability to think creatively and implement new solutions for the processes of production, services and trade.

The technological revolution has contributed to the destruction of the material basis of economies and societies. Its pervasive nature and the rapid, continuous spread of the achievements of information technology has resulted in the development of cooperation with a global reach. All revolutions are characterized by dependence on new knowledge and information. Thus, the distinguishing feature of the technological revolution is not the central role of these resources, as is often interpreted, but their application to the creation of new knowledge.

Dynamics of change in the economy and the functioning of enterprises

A core change is that technology is not only a tool to use, but is considered a process that can be constantly developed. At the same time, the boundary between creators and users is disappearing. The latter, by appropriating and redefining technology, contribute to its sustainable development. The coupling between the introduction of new technologies, and its use and development, will continuously increase its power and influence.

The increasing rate of change, and the difficulty of predicting the future, has entrepreneurs seeking solutions that allow for a flexible response to changes in the observed reality. This opens the way for the introduction of an emerging network paradigm into the area of management science, which is based on social networks studied in sociology, networks developed in the field of information technology and mathematical theory of graphs. The focus is on the relationships between the entities of surveyed populations (**Czakon, 2011**). Network structures are a response to increased uncertainty and flexibility, and are also a way to access resources and share risk. Virtual organizations are network organizations which focus on cooperation with other actors, often competitors, as well as with customers and suppliers, who are treated as valuable sources of knowledge and as partners in the processes of constructing and optimizing value added chains that go beyond the boundaries of individual firms. Companies join networks because it is becoming impossible to satisfy increasingly sophisticated and complex customer requirements individually. The influence of a virtual environment on the functioning of the economy and social relations must be considered in the context of the needs of the actors and the beneficiaries of its potential, because it is they who give cyberspace a specific value and meaning. One can agree with Malachowski, that it is the choice of the components of the virtual environment from the point of view of their performance, utility, functionality and smooth application which determines its penetration and popularity among users, which are broadly defined market operators (**Malachowski, 2005**).

The process of globalization is based on the conversion of an industrial economy to a knowledge-based economy, and on the transformation of enterprises, searching for their new places, forms, methods of operation adapted to modern economic conditions. The key changes in the economy, which are also factors for the emergence of network organizations, include scientific and technical progress, the development of capital markets, development in communication, the growth of the

knowledge-based economy, the characteristics of the global economy, the development of computer technology and the global computer network, the dynamics of change, time, flexible strategies that include the use of multiple operating strategies simultaneously, as well as competencies and resources. Through the development of new technologies, which are the result of scientific advancements, there are changes in the methods and means of production, in the process of distribution, as well as in the processes of sales and servicing. Economic activity is increasingly taking on a networking character, where the production of goods is the result of cooperation among many entities that share methods of management and technology. The high level of trust and mobility of people and businesses supports the mutual exchange of data, information and knowledge, resulting in increased quality of individual elements of production, increasing the quality of manufactured goods and services. Continuous technological development causes customer requirements to grow, and a comprehensive network of many integrated companies can better satisfy these needs.

The development of information and communication technologies has resulted in society and economies functioning on the basis of information organized on the model of a network. In this model, certain individuals and businesses create network nodes connected to each other through information-communication links that form the technical infrastructure supporting collaboration.

Mechanisms for achieving competitive advantage

In the modern economy, it is increasingly difficult to achieve a sustainable competitive advantage; only companies highly developed in terms of technology can count on such an honor. Therefore, for many companies, the only way out of this situation is to achieve a number of short-term competitive advantages. If it is impossible to count on long term benefits of a product, the winners of rivalry on the market will be those who manage to create a series of short-term benefits. Companies must devote much effort to maintaining their acquired, high market position, and even then, the dynamic changes in the economy do not give certainty for its sustainability. In order to meet this challenge, in its long term strategy, a company must find a place for flexibility, which allows for the modification of company operations according to market dynamics. The ability to manage change, and thus gain a competitive advantage, is made possible by new forms of network organizations, both inside and outside the company. To increase their competitive position, modern enterprises often become participants of network organizations. The effect of this is the increase in tangible resources, such as financial assets, and an increase in intangible resources, such as knowledge. In the network economy, companies are connected with their customers and partners, and their development is dependent on the enrichment and abundance of the networks of which they are a participant of, and their position in the network (**Dolińska, 2010**). A network has a smooth and dispersed structure, and is open to new connections. In business networks, there are many links that affect the company. Examples of links can be financial, informational, technological, product related or image related. Participation in a network allows companies to reduce costs, improve adaptability, reduce the level of uncertainty and risk and achieve competitive advantage (**Małysa, 2013**). At the same time, in decision making, a company functioning within a network must define the impact of the decision on other participants, or must obtain consent from the leader of the network to make changes.

According to C. Shapiro and H.R. Varian, in markets where there is a network effect, pioneers can count on the advantage of the first move, through the rapid acquisition of a large number of customers (so-called customer base), which will make subsequent entry of competitors much more difficult. The company should therefore seek to achieve critical mass, because it can mean a serious barrier to entry for potential competitors. In such a situation, two things occur: a so-called. *lock-in*, which hampers customers from leaving the company due to, among others, the lack of satisfactory alternatives, as well as the effect of a *lock-out*, which excludes competitors from the market (**Shapiro and Varian, 1998**). This leads to a situation where, due to the large number of people who use the given solution, the costs of switching increases and, consequently, the solution becomes the market standard. An example of this effect is the popularity of Microsoft Windows operating systems. The growing number of users of Microsoft operating systems increased the number of programs created for these operating systems, which led in turn to an increase in the number of users and so on. Observation of economic reality, however, shows that the scenario described by Shapiro and Varian does not always occur. It is often a follower, not a pioneer, that obtains a dominant position on the market.

In modern economic conditions there is a new paradigm for the operation of enterprises. It is the ability to generate value within a common economic space. Of particular importance is the acquisition of intangible assets such as information and knowledge. These values are created in the network through a continuous exchange between participants. There is also a faster diffusion of otherwise codified explicit knowledge, and the use of tacit knowledge of other partners. In networks, an important role is played by the integrator company, which has distinctive competencies in relation to production systems, technical infrastructure, level of technology, unique skills of staff, specific marketing methods, or the newest concepts of management. Networks are dynamic, which means that each member has a chance to be the integrator company if they have achieved a competitive advantage for one of the major distinctive competences. This may also be a company that has the advantage in terms of capital.

A way to gain competitive advantage may be to use the strategy of offering basic value for free and collecting payment for more attractive value. This strategy is sometimes called *freemium*, from the words *free* and *premium* (**Niculescu and Wu, 2011**). This strategy may seem attractive. By offering value for free, a company may gain more customers and become a more recognized brand. If they are able to turn a certain percentage of non-paying customers into premium customers (paying customers), then they also generate income and perhaps even profit. In practice, this model, which assumes that paying customers will be able to compensate for non-

paying ones, does not always work. The problem is being able to offer enough attractive *premium* value to customers who already receive some value for free, in order to make them willing to pay for it. A factor impeding the use of this strategy is often the reluctance to pay for online content or services.

There is another model for offering limited value for free. Value for free is often offered in the form of incomplete versions of products. For books, it may be possible to view several pages; for music – users have the ability to play parts of a song; in the case of software – users are offered a limited time or functional version of the product. In this case, value is offered for free mainly to minimize the risk for the buyer arising from the mismatch of the purchased product or service to their needs. This method resembles the *freemium* method to a certain degree, but there are significant differences between the two. Incomplete versions of a product, like free samples in the traditional economy, illustrate the value of the full version, and thereby encourage users (customers) to buy. This value is low in terms of consumption. In the case of the *freemium* model, the value offered for free is often characterized as being very attractive and is sufficient for most customers. In the *freemium* model, *premium* clients maintain non-paying customers, who may use the services of the company for a long time without making a single payment.

Innovation and its acceptability in the market

Some innovations spread very rapidly from the moment of their introduction to the market and have a wide application in just a few years after their discovery. In contrast, other innovations need a much longer adaptation period, such as electric cars. An example of fast spreading innovation are smart phones, for which demand has increased rapidly over the past few years. Manufacturers and merchants of this product were able to rapidly gain a competitive advantage on the market. Therefore, the question arises of what are the characteristics of innovation that affect the pace of its adaptation in the market? The rate of adaptation of innovation can be defined as the relative speed of acceptance and application of innovation by members of a social system. Overall, the rate is measured by the amount of people who have applied a new idea in a given period of time, such as a year.

To answer the above question, five attributes of innovation that affect their diffusion are presented (**Rogers, 1995**):

1. Relative advantage,
2. Compatibility,
3. Complexity,
4. Opportunity to test beforehand,
5. Visibility.

The first attribute Rogers notes is the relative advantage of the innovation, defined as the degree to which the innovation demonstrates its superiority over previous solutions known to the market. It is not important whether innovation brings objective advantages, but whether a person (the client) sees innovation as beneficial for themselves. Advantages can be measured in economic terms, but social prestige, convenience and satisfaction may also play an important role. In the case of smart homes, benefits include: safety, comfort, reduction in energy consumption and social prestige.

The second attribute of innovation is compatibility (compliance), defined as the degree to which innovation can be adapted to the life of the recipient, the user of the product. Innovations that are consistent with existing values, previous experiences and needs of potential users, penetrate faster than those that are incompatible with the norms and values of the social system. A very good example of compatibility is compliance with older standards – standard GSM digital telephony allow communication not only with other GSM phones, but also with landlines. Another attribute of innovation highlighted by Rogers is complexity, i.e., the degree of difficulty in understanding, adopting and applying new solutions. The degree of complexity of a new solution as perceived by users (clients) have a negative impact on the rate of diffusion. The easier the product is to use, the faster its recipient will start using it. Complicated usage of a device may constitute a fairly large barrier for a group of people unfamiliar with new technology.

The fourth property of innovation is the possibility of checking, or testing innovation prior to adoption, for example, an opportunity to try out innovation for free. This strategy is often used when launching new software. This strategy has gained importance in realizing the concept of Living Labs. The concept of living labs assumes that the infrastructure of smart cities compromise a research space for its users - residents and organizations (**Komninos, 2012**). In contrast to traditional research, the objective of the living lab is not to improve knowledge in a particular field of science, but to provide real solutions to problems faced by users of the city and help fulfill their needs. This concept is based on the involvement of consumers in the identification of problems and willingness to contribute to solutions. For example, in Helsinki, the city developed an experimental city district together with residents and experts from various fields, including architects, computer scientists, designers and psychologists.

The last attribute of innovation highlighted by Rogers is visibility, that is, the extent to which use of the innovation is visible to others. This factor is very important in the propagation of information about innovation and arousing interest in it. The pace of adaptation of innovation is not only affected by the characteristics of innovation, but also by variables such as the type of innovation decision made, the communication channels used, the type of social system present and the involvement of companies (institutions) to promote change. Adaptation of innovation in the market may have a direct or indirect impact on the functioning and growth of many companies in a given sector. Adaption of innovation often increases demand for specific products and services. Products with a high degree of innovation may provide significant revenues from sales for certain companies. These companies are quickly able to achieve a clear competitive advantage in the market (**Czarniewski, 2014**). Other important elements in the modern economy are creative intellectual capital and innovative solutions proposed by staff, such as patents and industrial designs. In 2012, the Polish Patent Office received 21,013 items of intellectual property, including 5, 351

patent applications and utility model applications for protection from various institutions and national centers. For comparison, in 2011, there were less than 500, and the year before 1,300. The annual report of the Patent Office for 2012 shows that most patents were filed by the Technical Universities in Wrocław and Poznań and by the Academy of Mining and Metallurgy in Krakow. A total of 13,100 patents, trademark rights and rights of registration of intellectual property were granted in 2012 (**UPRP Report, 2012**).

Universities and research institutions act as providers of knowledge (ideas, technologies), which is essential to building new economies. Science, as well as lower-level education, contributes to creating a climate conducive to technological progress and innovation. A necessary condition for building a knowledge-based economy is a close link between the research sector and enterprises, especially SME's. With such an alliance, it is possible to effectively use the knowledge provided by scientific and research infrastructure. A knowledge-based economy behaves differently from an old market economy. In such an economy, information and knowledge are very important. Active use of knowledge is based on its continual development. Organizations have to be prepared for constant innovation and continuous systemization of changes in operation techniques. They should also develop scientific research centers. Ensuring the continuity of innovation processes requires controlling the development of knowledge and its applications at different levels. This is why large organizational systems play a key role in the new economy. Organization of the new economy combines features of free and controlled markets. In the current market economy, the State is involved in the control of the economy. Their task is to create macroeconomic conditions conducive to the development and diffusion of knowledge and maintaining the continuity of the innovation process. However, the dominance of large systems does not mean the disappearance of small businesses. On the contrary, the role of small and medium-sized enterprises is very large. This role will continue to increase with the further development of the service sector.

Conclusion

The Present often excludes from its framework stagnation and lack of progress. The main features of our time is movement and change, progress and development. Therefore, humans and organizations, and the approach to problem solving in itself, should have a set of tools to help navigate through the intricate paths of modernity. Knowledge, creativity and an innovative approach, but also thinking liberated from stereotypes, determine growth and economic progress in every area of life. Openness and flexibility also allow for adaptation to new conditions in a changing world. Currently there is a strong emphasis on the importance and necessity of creative intelligence in the development of enterprises.

The globalization of markets, the increase in the number of entities cooperating with one another, and the increase in the range of vertical and horizontal co-operation contribute to the search for appropriate technological solutions in the context of operating systems, which enable fast and efficient flow of information necessary to make informed decisions about various areas of economic activity. Appropriately integrated systems support implementation of these activities in an enterprise or a group of cooperating enterprises. Currently, the main goal of integrated systems is to support management, reduce operating costs, improve customer service and gain competitive advantage in the market.

There is no doubt that the role of people, both employees of individual companies and entire societies, is growing in importance. This is due to the fact that the public are becoming more aware of their surroundings, increasing their knowledge and experience. Knowledge, which is the basis of the new economy, is brought by people. There is talk of a new type of knowledge-based society, having the ability to acquire, understand, teach, create new values, and design communication based on data and information.

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