

**IV INTERNATIONAL
CONFERENCE
QUALITY SYSTEM
CONDITION FOR
SUCCESSFULL BUSINESS
AND COMPETITIVENESS
PROCEEDINGS**



CENTER FOR
QUALITY
KRAGUJEVAC



ASSOCIATION FOR
QUALITY AND
STANDARDIZATION
OF SERBIA



CENTER FOR
QUALITY
PODGORICA

KOPAONIK, 30/11.-02/12/2016

**ASSOCIATION FOR QUALITY AND STANDARDIZATION
OF SERBIA**

IV INTERNATIONAL SCIENTIFIC CONFERENCE

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P R E F A C E

Dear fans of quality,

Association for quality and standardization of Serbia in cooperation with the Center for quality of Faculty of Engineering Kragujevac, Center for Quality Faculty of Mechanical Engineering Podgorica, College of technical studies & technology Krusevac, Middle and South East European countries Quality Initiative, with support of Accreditation Body of Serbia, Serbian Association of employers and Serbian chamber of commerce, this year continues the tradition of improvement quality infrastructure in the Republic of Serbia by organizing the 18th National and 4th international conference Quality system condition for successful business and competitiveness.

At this conference will be discussed about many topics, and the most significant we emphasize improvement of quality infrastructure, development and establishment of IMS - from practice to practice, path to business excellence, knowledge management, quality culture, innovation and quality, quality in the public sector, motivation and quality, audit and certification.

The significance of this meeting will provide organization of round table discussions:

- ☞ The new version of ISO 9001 and ISO 14001 - one year later*
- ☞ The modern world - a world of changes and learning*
- ☞ Our food on the world market*

These roundtables will enable consideration about significant issues of extreme importance for improvement quality infrastructure in Serbia. There is especially significant round table "Our food on the world market", where the experts in this area will point out the easiest way for selling our food on the world market, that is more and more demanding.

Articles published in the Proceedings gives the opportunity to entrepreneurs to find the right strategy, policy, to define objectives in the field of quality management system, environmental management system, and occupational health and safety management system in order to strengthen its competitive position on the market and maximize satisfaction customers / service users

On behalf of the Organizing Committee of the 18th National and 4th International scientific conference to thank to all article authors and co-authors, co-organizers, sponsors, and all those who have supported, participants from Serbia and abroad who have helped to make this conference successfully.

President of the Organizing Committee

Professor Zoran Punoševac PhD

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TECHNOLOGICAL COMPETENCE IN ORDER TO INCREASE COMPETITIVENESS AND SUSTAINABILITY OF ORGANIZATIONS

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Abstract: *The primary goal of any organization is its long term sustainability and making a profit for the owners by satisfying all stakeholders. In order to achieve this, the organization needs to be competitive compared to the competitors in the market during the implementation of products and services. During the time there were many concepts that tried to explain the sources of competitiveness and components by which it is achieved. The aim of this paper is to briefly present some concepts that have existed or are still current through the various views of scientists who have research this area and through them show how technological competency of the organization participate in the creation of competitive advantage and sustainable success of the organization.*

Keywords: *organization, competitiveness, competitive advantage, competency, technological competency, sustainable business*

JEL Classification: M190

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1. INTRODUCTION

In order to perform more complex tasks that an individual is not able to perform independently, because of the wide variety of operations, large width of necessary knowledge and specialization and the lack of time and in the end due to the low efficiency, it requires a quality organization and management. For the realization of products, organizations use certain technologies that represent accumulated and materialized knowledge of previous generations. Intellectual property protection has prompted the development of technology which the owner could cash in and reward his efforts, invested in its development. Technological changes have led us to today's technological age, with a lot of sophisticated products and services that increase the standard, make life easier, but that also have traps in a loss of privacy and individuality. As a result, demand for technological competence of the organization as one of the components of organizational competence in the function of its competitiveness and management with the aim of sustainable success.

2. COMPETITIVENESS OF ORGANIZATION AND COMPETITIVE ADVANTAGE

Large and sudden changes in technology, development, demand and customer needs ground the feet under the market leaders, creating new opportunities for competition to take the current market or replacement of new. If the organization does not adapt to trends, does not understand the wants and needs of customers and does not create new demand with their innovative products and services, very soon it will lose the current position in the market and bring into question its survival. The current state of the organization, is no guarantee of success tomorrow, regardless of the current above-average profits and market leadership. The primary mission of the organization is long term sustainability, while profit is byproduct of excellence achievement. (Collins & Devanna, 2002, p. 198.) The basis of survival is the competitiveness of the organization with which it compete with its rivals in the market. Competitiveness refers to the performance of business activities in relation to their competitors and is determined by external and internal factors of the organization. On the micro level or organization, competitiveness is defined as the ability to produce products or services in a given quality, given price and in a given time, which means to satisfy customer needs more efficiently and effectively than the competition. This is the ability to compete with competitors of which the organization has to be more productive and better. The competitiveness of the organization consists of competence of the organization, quality management, creativity and capital. (Buntak, Droždek, & Rašan, 2015, p. 81). Building competitiveness of the organization is the basic task of management, organized and implemented through a meaningful developed strategy. The strategy is a plan election of market arena, the way to compete in that arena and forms of satisfying customers and plan activities to achieve competitive advantages. (Rahimić & Podrug, 2013, p. 278). Competitive advantage is the ratio of the relative character and shows how organization is better in something than the competition, but its origin can be in external and the internal environment of the organization. Competitive advantages are achieved, for example, due to lower costs, characteristics of products and services and better quality of the same, the location or the good image of our own brand in relation to competitors. (Bamberger & Uпитz, 2011, p. 169). Competitive advantage exists if three conditions are fulfilled:

- customers perceive a constant difference in the important characteristics of a product or a service of an organization and its competitors;
- difference is a direct result of the gap between the skills of organizations and competitors and
- that difference and the gap can be expected in the future. (Coyne, 1986, p. 57.)

In the global market is a free flow of people, material capital, finance and information. Therefore, the concept of creating a competitive advantage should be seen through the theory of international organizations. Historically, it ranks from foreign trade theory to the theory of absolute cost advantages (A. Smith), which Smith introduces the specialization and division of labor in economic theory, and the theory of comparative competitive advantages (D. Ricardo). Then there are the

theories of international direct investment, which include diamond model of national competitive advantage (Porter), product life cycle theory (Vernon), learning theory (Johanson / Vahlne), thorium behavior (Aharoni), monopoly theory (Hymer / Kindelberger), the theory of internationalization (Bukley / Casson) and the eclectic theory of international production (Dunning). (Rahinić & Podrug, 2013, p. 288.).

2.1. The structural approach

Economic development, by introducing dynamic elements such as economic resources, market size, foreign capital inflows and economic policies during the eighties of the twentieth century, is seen as a process determined by the national performance of the country itself. The dominant paradigm considerations competitive advantage was through a structured approach to strategy SCP (eng. Structure-conduct-performance) of the theory of industrial organization. According to this model competitive advantage is related to the existing activities of industry and current market. Advantage over its competitors in this approach is realized by strategic positioning in the industry. The attractiveness of the industry and the relative position of the organization in that industry is a measure of an success of the organization. According to the views of the structuralist school of strategic management, industrial structure has a central role in determining and limiting strategic action. The aim of the organization's strategy, according to this model, is to find a position in the industry where the organization can best defend against competitive forces and where it can best influence at the strength in terms of its long-term benefits. To do that, it is necessary to have sustainable competitive advantage, which enables long-term above-average results in the industry, and which are not the result of unusual market conditions. (Tipurić, 1999, p. 10). Michael E. Porter introduced the concept of competitive advantage in economic theory. Availability of labor and natural resources as the basis of comparative advantage has been replaced by the ability of companies and organization in the creation of elements that strengthen the position of those as competition. (Bezić, 2008, p. 35.). Porter has created a model of "five competitive forces" (the barrier of entry for new competitors, customer power, supplier power, rivalry of existing competitors, substitutes), which is used categories of industry organizations such as market power, profitability, entry and exit barriers that would explain the efficacy and performance of the organization. Outperform direct competitors in the industry organization can by establishing a difference that may be held. This difference is reflected in the gap between the performance of activities that, according to Porter, have origins in two possible forms:

1. lower costs - delivery of equal value to customers at a lower industrial cost making products and services and
2. differentiation - the delivery of higher value to customers with the average industrial costs compared to the competition. (Porter, Competitive advantage, 1985, p.3.)

Competitive advantage enables organization superior profitability due to the premium prices and greater efficiency.

2.2. Resource view on the organization

Structuralist approach has been replaced by the twentieth century by the resource view of the organization (eng. Resource-based view of the firm - RBV) as a competitive positioning in existing industries becomes secondary strategic issue because of strong uncertainty and volatility of the overall environment. Competitive struggle moves toward future markets and new activities which enable above-average profits. (Hamel & Prahalad, 1994). Longer is not only important good positioning in the industry since the rapid changes primarily technology and desires of customers and demand, and the industry itself has become questionable. Organizations are turning to internal forces and build their competence ensure its long-term survival in an uncertain and unpredictable environment. A strategic approach based on resources starts from ways how the organization secures the necessary factors to create a core competency and skills that are the basis of developing

and maintaining a competitive advantage. In resource based competitive advantage is the result of heterogeneity and immobility of resources and their asymmetric distribution in various industries. (Kotlica, 2005, p. 47.)

2.2.1. Key competencies

Resource-based theory of the organization has more lines of development that depends on key factors of competitive success of the organization. The greatest impact has the concept of key competencies (core competencies), which is the source of the concept of "Distinctive competence" developed by Sleznick 1957. For these, are the most deserving, C. K. Prahalad and Gary Hamel, who have created a theoretical framework for the success of the organization on the basis of internal competitiveness. (Prahalad & Hamel, 1990). Long-term success is linked to finding ways of confronting the competitive environment and rely primarily on internal resources and power, rather than the mere use of the opportunity of the current market and existing activities. As a basic premise of long-term success appeared key competencies. (Hamel & Prahalad, 1996, p. 30). Core competencies are the collective learning in the organization that are specifically related to how coordinate different production skills and integrate them with the flow of technology. They have increasing returns, which is a key feature of invisible assets and technology to endogenous growth theory, while using they increase and grow, and not using them they shrink and wither away and connect different existing business activities, creating synergy of greater value and initiate the development of new businesses. Core competencies are the three key characteristics that can be identified:

- potentially allow wide access to different markets;
- significantly contribute to increasing the benefits to the customer of the final product;
- competition can hardly imitate core competencies, especially if there is a complex harmony between the individual technologies and production skills. Competition may adopt a specific technology that includes core competencies, but very difficult will be able to copy the model of total internal coordination and learning organization. (Prahalad & Hamel, 1990)

The goal is to achieve world leadership in the design and development of specific groups of product functionality that can be held in a specific area of key competencies, maximizing participation in key products on a worldwide basis. (Kotlica, 2005, p. 136.)

2.2.2. Dynamic capabilities

Teece, Pisano and Shuen developed based on the concept of key competencies, the theoretical framework of "Dynamic capabilities" . Dynamic capabilities are those which permit:

- timely understanding and predicting and exploiting favorable new opportunities;
- reconstruction and protection of property based on knowledge, competence, complementary assets and technologies to achieve sustainable competitive advantages. (Teece, 2000, p. 26.)

These are the organization's ability to create new and innovative forms of competitive advantage. Internal and external competence is necessary to quickly build or redesign and integrate in order to respond to the fast changing environment. (Teece, Pisano, & Shuen, Dynamic Capabilities and Strategic Management, 1997, p. 516). Access to dynamic ability emphasizes that organizational competence must change over time, in order to respond adequately to changes in the environment and achieve and maintain competitive advantage. This approach also highlights the need for organizational learning and innovation. A good indicator of the internal entrepreneurial dynamics of the organization can be seen in the process of innovation which introduce new or improved products or processes that are new to the organization. (Buntak, Klopotan, & Bencic, 2013, p. 113.)

2.3. Organizational resources

Organizations use the resources in the process of transforming them into products and services. Creating value in the organization has its foundation in the solid base of the assets from which organization can create abilities. Successful management of resources from which new products are created, processes and other activities that create competitive advantage is called core competencies. The sustainability of competitive advantage depends on the ability of the organization to continuously innovating products and processes. (Byers, Dorf & Nelson, 2015, p. 102.)



Picture 1. Value creation pyramid

Source: Byers, T.H., Dorf, R.C., Nelson, A.J., *Tehnološko poduzetništvo, od ideje do tvrtke, Tehničko veleučilište u Zagrebu, Zagreb, 2015., str. 102.*

If these resources are owned by the organization valuable, rare, difficult and expensive for imitation and irreplaceable in the process of transformation (eng. Vrina - valuable, rare, inimitable, and nonsubstitutable) and can provide above-average profits, they become the basis for sustainable competitive advantage. (Eisenhardt & Martin, 2000, p. 1105). Resources include assets and capabilities. Assets can be visible and invisible. Visible property has a physical form, can be touched, heard, see and smell, recorded in the balance sheet of the company and it can usually be traded. It includes buildings, equipment and money. The invisible assets has no physical form and usually exist in the minds and thoughts of people. It can by many times to increase the value of the company above the value of physical assets. It is intangible and financial assets that are not explicitly stated in the balance sheets of organizations. It includes patents, copyrights, reputation, trademarks, trade secrets, customer relations, relationships between employees and the knowledge that is objectified in various forms such as databases. (Kotlica, 2005, p. 251). Abilities are resources that are invisible and include skills, experience and qualifications of employees and organizational routines. Abilities can be strategic, functional and operational. They are invisible resource and depend on knowledge and reminiscent of the learning process and must be maintained to prevent their reduction or disappearance over time. They can be a source of competitive advantage, depending on the skills of their routine use. Capabilities are limited by the internal and external environment of the organization. (Den Hond, 1996). As organizations increasingly realize the value of invisible assets that they own, the difference between the invisible assets and competencies becomes less clear. In order to create an invisible assets such as knowledge, brands and reputation, needed are capabilities on the individual, group and organizational levels. (Hooley, Broderick & Moller, 1988, p. 100). Resources can be a source of competitive advantage, but it depends on the success of their use in the organization. The success depends on the skills of management skills

within the constraints and opportunities of environmental organizations. Organization is managed by managers whose skills are in managing resources and capabilities called competencies of the organization. (Kotlica, 2005, p. 129th to 130th)

3. COMPETENCE OF THE ORGANIZATION

The word competence comes from the latin word which means competere „be proper, aspire on the it“. The word means capable, competent, informed, who knows, an accomplished, trained, competent, authorized, authoritative. This means the qualified person who knowingly or authority has the right to do something and solve this something to judge. (Buntak, 2012, p. 405.) The competence of the individual, as well as a proven ability to apply knowledge and skills, and the ability of the organization, as well as the possibility of processes, systems and organizations to realize the product or service according to the requirements laid down for that product or service, together constitute the competence of the organization.

The competence of the organization can be expressed as:

$Ko = \{Khc, S, a, r\}$, where is:

- Ko- competence of the organization
- Khc – competence of the human kapital, employees
- S – sum of key competence (organizational, technical and technological) from S1 to Sn with condition $S \geq 2$
- a-attributes, system properties
- r-relation, connections between elements of the system (Buntak, Adelsberger, & Adelsberger, 2011., str. 35.)

The competence of the organization must be more than just skills of carriers individuals within the organization. It is a response to the demands of a complex environment seeking the integration of competence of the individual in the organization and technical, technological and organizational capabilities of the organization, to enable timely and adequately respond to the incentives of dynamic environments. It reduces the chance or uncertainty, in the process of management in uncertain dynamic environment and with documented and manageability become one of the three key features of of management to achieve sustainable success of the concept of quality management systems. (Buntak, Adelsberger, & Adelsberger, 2011, p. 35.



Picture 2: Elements of organizational cometenace

Source: Buntak, K., Droždek, I., Rašan, I., *The interdependence of structural competence, organizational maturity and competitiveness, III international conference, Quality system condition for successful business and competitiveness, Proceedings, Association for quality and standardization of Serbia, (pp. 77.-88.), Vrnjačka Banja, 2015., str. 81.*

The organization as a system has the characteristics of its subsystems as is made up of employees, which means that it depends on the competence of its employees. However, for long-term competitiveness of the organization are not only sufficient competence of human capital to ensure sufficient competence. Organizational competence consists apart from human capital also of technological competence, technical competence and structural competence. (Buntak, Droždek, & Rašan, 2015, p. 80.). Competence of human capital are knowledge and skills necessary to do the specific task. Organizations need to invest in skills of their employees through education, training and competence development and thereby create knowledge of organization. Organizational knowledge creates long-term potential to achieve competitive advantage. Technological competence is associated with knowledge and skills needed to maximize the efficient and effective performance of the process on the object of work. Technical competence represents the knowledge and skills to effectively and efficiently use resources and methods of work on the means of work. Structural competence is defined as organizational knowledge and skills by which the organization adapts to changes and influences from the environment, through the organization of work and creating the optimal organizational structure in order to achieve organizational goals.

3.1. Technological competence

Technological competence includes internal organizational ability to understand, use and exploitation of the relevant technology. They allow the organization to be a pioneer in the market through new product development or use of new manufacturing processes. (Ritter & Gemünden, 2004, p. 550.) The technological competence as a part of the organizational competence includes technology together with the products and services resulting from this technology and knowledge management in the form of intellectual capital stored in people, structures, relationships, and intellectual property. Many scientists believe that the technological competence of the organization's ability in efficient use of technological knowledge and learning in order to develop and improve products, services and processes. They are set of activities and behavior embedded to detect and shape the opportunities and threats, to measure the opportunities and manage competitiveness through improvements, combination, protection and where it is needed reconfiguration of organizational visible and invisible resources. In doing so, the dynamic capability and that are used for creating or restoring organizational skills and especially the technological capabilities of the organization. (Acura, Kandemir, De Weerd-Nederho, & Song, 2010, p. 917). Competencies can be measured in two ways:

- in degree of execution of tasks and qualifications - as an internal view or
- since the competence can not be viewed from the outside, can be compared in relation to competitors, such as, whether the organizational competence in a particular area is higher or lower than the competence of its competitors. (Ritter & Gemünden, 2004, p. 549.)

3.2. Competitive advantage through technological competence

The technological competence plays a key role in maintaining a competitive advantage in turbulent industry. The technology, as the term is often used in the business world. This term is significantly associated with science. However, science puts in the focus basic research, while important for business is applicative foreign technology and its commercialization. Technology is the fundamental cause of the existence of the product life cycle. With the introduction of new products, improvements are fast and functionality of the product is growing rapidly. As technology matures, the pace of change functionality stabilize until a new shake when new technology replaces the old and the cycle starts all over again. Technology is, as the concept of evolutionary organizational learning, in basis of the development strategy. The construction, maintenance and improvement of the competitive advantage of is a strategic goal of every organization. Competitive advantages are associated with the ability to manage technological resources and the managing different types of visible and invisible assets such as technological knowledge. The development of strategy leads to interaction between technological skills and competence and also leads to the interaction of the

strategy itself and the experience that is collected using the strategy. Experience serves as a feedback which corrected skills and competencies and its own technological strategy in terms of creating and improving competitive advantage. (Kotlica, 2005, p. 129th to 130th). The technological competence of the organization as part of a larger system play a key role in explaining the different phenomena such as globalization, technological discontinuity and industrial dynamics (Tushman and Anderson, 1986; Carlsson, 1987; Dunning, 2000). Malerba and Marengo by exploring the Italian manufacturing sector, find a positive relationship between technological competence and business profitability in sector of high technologies, so consider the most relevant technological competency to achieve long-term competitiveness of the organization. (Malerba & Marengo, 1995, p. 475.) The importance of technology for the organization is bound to create a competitive advantage. Therefore, the technology can be considered as a resource of strategic importance to the organization. Its ability to take advantage of technology describes its technological competence. Technological competence can improve product portfolio organizations through the new features of the product, its new features, greater reliability and the reduction of costs.

4. CONCLUSION

Today's organizations are characterized by high dynamics, high levels of uncertainty and complex relationships. Everything is in constant motion. Technological environment is progressing daily and makes the organization an adequate response. Creativity and creation are the only guarantee of survival. The basic strategy is to create a competitive advantage by differentiation or lower costs than the competition which organizations in the market makes profits and good prospects for further survival. In this way a large, almost decisive, role has technology that organizations achieve greater efficiency in the creation of products and services. Technology has both endogenous and exogenous character and it is materialized result of knowledge generation. The organization must be competent to deliver added value to the customer and must have the dynamic ability to respond to rapid and unpredictable changes in the environment. It also needs to act actively and reactively to environmental influences accompanying competition in knowledge and competence and at the same time creating its own base of competence effectively managing knowledge and the creation of intellectual capital in an organization that learns. Technological competence is crucial for long-term survival of the organization.

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