

# INTELLECTUAL CAPITAL – A COMPETITIVE ADVANTAGE OF MODERN BUSINESS SYSTEMS

DRAŠKOVIĆ N. MILAN<sup>1</sup>, SMILJIĆ SAVA<sup>1</sup>, KUKRIĆ MILENA<sup>2</sup>

<sup>1</sup>Faculty for strategic and operational management, Belgrade, Serbia  
[mvrasko@eunet.rs](mailto:mvrasko@eunet.rs), [ssmiljic@sezampro.rs](mailto:ssmiljic@sezampro.rs)

<sup>2</sup>Small and Medium Enterprises Management Faculty, Belgrade, Serbia  
[milenakukric@gmail.com](mailto:milenakukric@gmail.com)

**Abstract:** *In IT age, i.e. digital economy, information, and knowledge (explicit and tacit) possessed by a business system are the basic resources for creating new added value needed to achieve and maintain a competitive advantage in the global market. This paper will cover intellectual capital, intellectual capital management, and generation of knowledge (knowledge acquisition and development) in modern business systems.*

**Keywords:** *intellectual capital, intellectual capital management, innovation, knowledge, competitive advantage*

## 1. INTRODUCTORY REMARKS

Modern business environment is constantly changing under the influence of numerous external factors caused by the processes of globalization and information-telecommunication technologies, makes it difficult for business systems (production and service) to achieve and maintain competitive advantages. Present managers nobody should remind that we live in global-economic environment which is more and more complicated and subject to changes [9]. The digital economy has provided a competitive advantage with the material and financial sphere (quantity) in the sphere of non-financial and intangible (knowledge). A business system can achieve a competitive advantage only if it has relevant knowledge of their competitors, or if it has the intellectual capital, which is implemented in their products or services. Intellectual capital is the intangible resource of unique business system that offers endless opportunities for growth and development of the system. Successful organization and management of intellectual capital create new values with which sustainable competitive advantage in the market can be achieved. Business systems that want survival, growth, and development in the global market must base its policies on intellectual capital, new business methods, new systems of value and continuous investments in new knowledge. Continuous investment in new skills and knowledge within the distribution system increases the intellectual capital of its own employees and the transformation of this knowledge through the production or service processes creates a new value with which competitive advantage could be achieved.

## 2. KNOWLEDGE AS THE NEW PARADIGM OF CONTEMPORARY BUSINESS

Today, the business systems are faced with exponential growth of knowledge, the progressive deterioration of existing knowledge and rapid innovation cycles of a wide range stirred up by tired up by competition, forcing managers and employees to ongoing improvement of existing products, services and production processes in order to successfully meet the challenges of global competition. Knowledge in a turbulent environment is a major economic resource in the creation of new values and has a strategic role in the efficient conduct of modern business systems. In time of rapid changes and uncertainty, those business systems that continuously create new knowledge, distributing them through new business models, new technologies, new products or new services are successful. Knowledge of a business system is a set of facts, information, and skills acquired by training or experience of its employees and it is a source of creativity, innovation, and adaptability of the system to new situations.

European Committee for Standardization-CEN provides the following definition, "Knowledge is a combination of data and information, to which an opinion is added, expert skills and experience, resulting with the ability to add values and which can be used to assist in the process decision-making."

According to T. Housel, "Organizational knowledge is made of refined information, built in routines and processes that enable action."

C. O'Dell provides a simpler definition, "Knowledge is information in action".

Information society i.e. digital economy changes the established methods of doing business and creates new business models and new business paradigm based on knowledge and intellectual capital. In the context of information society knowledge is a set of information that have meaning, relevance, accuracy, ... and that increase the knowledge of the recipients, and by which it can acted (business decision making) in order to create new values through business activities. From the point of artificial intelligence, the knowledge is formalized information referred to or used in the conclusion process (deduction).

There are numerous attempts of knowledge systematization, but the most important division in terms of knowledge of business systems is a division to explicit and tacit knowledge.

*Explicit knowledge* is formalized objective knowledge related to plans, projects, reports, licenses, patents, manuals, books, manuals, products, processes, policies, strategies, models, databases, computer software, data warehouse, etc. Explicit knowledge is codified (letters and numbers) in a form that can be easily stored and distributed to others in formal and systematized way of personal communication or application of modern information and telecommunication technologies based on Internet technologies i.e. Web technologies (Intranet, Extranet, etc.).

*Tacit knowledge* is subjective, unstructured, immaterial knowledge, the property of the individual and represents its knowledge acquired through experience, intelligence, skill, intuition, hunch, etc. Tacit knowledge is a mental model of individuals and collective mental model of the organizational culture of a business system, which can be divided into two dimensions:

- Technical dimension (know-how), and
- Cognitive dimension (schema, mental models, perceptions, etc.)

In most cases it is not codified and it is exchanged during the dialogues (meetings, audio and video conferences, etc.) using a metaphors. Tacit knowledge is very important for achieving competitive advantage because it is immaterial knowledge and it is difficult to imitate, and its value increases with its implementation into new processes, products, or services. Many successful business systems are trying to turned tacit knowledge of their employees into explicit knowledge (written reports, audio and video), which would remain in the ownership of the business system in the case of workers going into retirement or other business system.

Table 1. Shows the characteristics of explicit and tacit knowledge according to S. Winter.

<b>Explicit knowledge</b>	<b>Tacit knowledge</b>
It is possible to learn it	It is not possible to learn it
Articulated	Non-articulated
Visible during the usage	Invisible during the usage
Simple	Complex
Independent	A system element

In addition to the explicit and tacit knowledge in business systems, there is experiential knowledge in the business system and it is specific to certain operating systems and is an important factor of competitive advantage. According to Nonaka & Takeuchi, the experiential knowledge is knowledge that includes experience and working knowledge of individuals.

There is a division of knowledge according to the substance, as follows:

- Factual knowledge (data and information)
- Procedural knowledge (algorithmic and heuristic processes), and
- Knowledge in judging (constraints and objectives)

Successful managers make business decisions and create a new value based on combining the acquired knowledge: scientific knowledge, the knowledge typical of performing the activities, knowledge of the business system in which work and personal tacit knowledge. The success of the business system depends on:

- Organizational skills which include strategy, system, structure, leadership and culture of business systems, and
- Individual abilities of managers and employees - characteristics, skills, mental models and value of individuals within the business system.

For successful operation of the system, the existence of strong links between organizational and individual capabilities and their synergistic effects is very important. It should be emphasized the link between mental models of individuals and organizational culture (collective mental model) that is the most effective. Mental model of an individual is a part of its ability accumulated by experience to make business decisions and to initiate effective actions to achieve new values. Organizational culture is becoming increasingly important element of successful business system, and it is a system of dominant values (knowledge, experience, belief, morals, customs, etc.) generated and acquired in a business system by employees at regular intervals. It encourages innovation and individuality in taking risks and

it represent a means of gaining competitive advantage. Figure 1 shows the connection between organizational and individual capabilities.

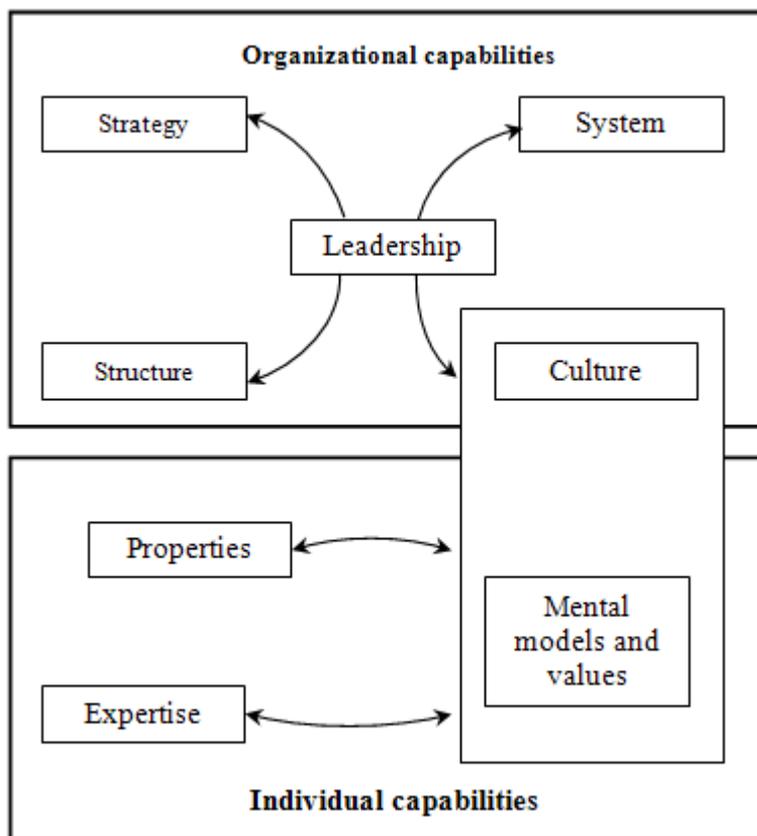


Figure 1: Relationship of organizational and individual capabilities [5]

## 2.1. Knowledge Management

The progress of science in information technology has facilitated the process of education, media, and cultural edification and of course the process of management and organization.<sup>1</sup> Knowledge management is a new direction for management that emerged in the mid '80s of the last century and it represents the concept of a system for collecting, organizing, storing, generating, distributing, and applying knowledge in order to achieve and maintain competitive advantage of the business system.

Knowledge management is the rational process by which knowledge, as a form of intangible capital, collects, stores, innovates, distributes and implements in decision making. It includes a variety of skills, techniques, and tools that provide the latest knowledge related to intellectual capital, which are used in business decision making.

<sup>1</sup> Mikić, S., et al., Economy reengineering at the beginning of 21<sup>st</sup> century, International journal of economics and law, Vol. 1, No. 3, Novi Sad, 2011.

A. Ward, "Knowledge management is defined as the collective knowledge (including experience, skills, information, and data) of an organization. It includes internal knowledge and knowledge selectively collected from external sources in order to improve the organization."

According to G. Probst knowledge management is based on "elements of knowledge management":

- *The objectives of knowledge* relate to formulation of strategic, regulatory, and operational goals of knowledge in the development of business systems, so the future development of knowledge in the system is directed toward the goals of knowledge,
- *Identification of knowledge* should include identification of existing knowledge and lacking knowledge,
- *Acquisition of knowledge* involves the integration of external knowledge holders to acquire new knowledge and strengthening the base of organizational knowledge through learning and training, purchase or exchange of knowledge by applying new information technologies,
- *Development of knowledge*, it is important to constantly work on developing new knowledge and skills at individual, team, and organizational level with a focus on creating the necessary skills through training, learning and teamwork,
- *Sharing of knowledge*, it is important to make knowledge accessible and available to all employees at the right time and right place,
- *Preserving of knowledge* implies its codification i.e. documentation of the development process and use of knowledge; and
- *Recognition of knowledge* refers to the measurement of the effects of applying the elements of knowledge management in relation to the objectives of knowledge in the business system. Figure 2 shows the elements of knowledge management by G. Probst.

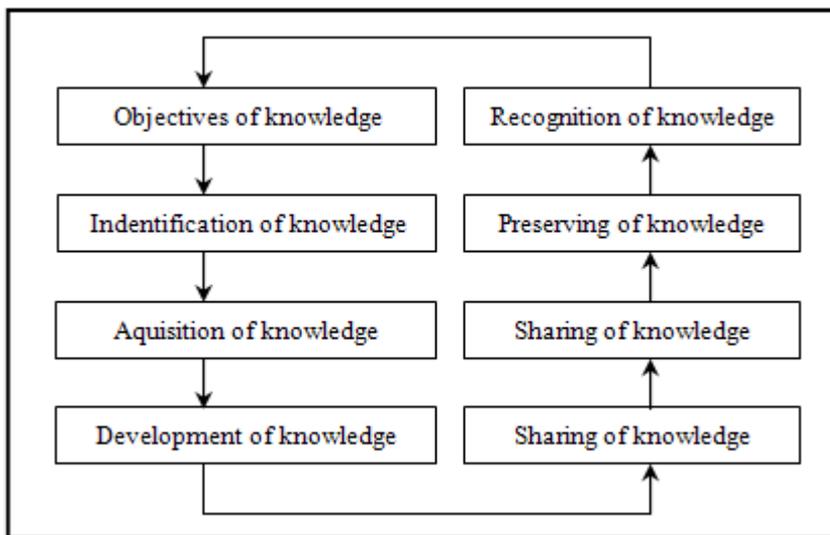


Figure 2: Elements of knowledge management [5]

European framework for knowledge management defined by the European Committee for Standardization includes the three most important works in the field of knowledge management - business focus, key activities and personal knowledge and organizational skills.

- *Business focus*, it is very important for knowledge management because it should represent the business processes that take place in the business system - strategy development, innovation, development of products/services, production processes, service delivery, sales, and customer support, creating new values in business system. These processes are becoming more integrative, as business systems, thanks to new Internet technologies, remotely collaborate with suppliers, partners, and customers.
- *Key activities of knowledge*, the main activities of the knowledge management process in the business system are identification of knowledge, knowledge creation, knowledge storage, knowledge sharing, and use of knowledge, which are performed with the support of broader business processes. In these activities, it is important to choose the right methods and techniques for knowledge management.
- *Organizational capabilities*, knowledge management includes two major categories - personal capabilities (ambition, skill, experience, behavior, personal knowledge, tools and time management) and organizational capabilities (mission, vision, culture, planning processes, planning, organizational structure, and technologies, and infrastructure, measurement, etc.). Creating knowledge and holders of key activities at the level of business system should be all employees (managers at all levels of management and employees) as external partners - suppliers, and consumers/customers.

Combining of different methods, models, techniques, and means of knowledge within the business systems and application of the analysis and relevant elements of knowledge management, managers come to the knowledge of how it is possible to improve the efficiency and effectiveness of business systems.

Today, all systems of knowledge management are based on modern information and telecommunication technologies as follows:

- Communication technologies,
- Collaborative technologies, and
- Storage technologies

More and more systems for knowledge management are using methods and tools of artificial intelligence - expert systems, neural networks, fuzzy logic, and intelligent agents.

### **3. INTELLECTUAL CAPITAL**

Intellectual capital is a relatively new complex economic category, which represents the sum of intangible assets of the business system where resources are intangible, such as know-how, competence, innovation, corporate culture, brands, etc. which is not explicitly shown in the accounting statements, but creates new added value to be verified on the market in the form of competitiveness.

Intellectual capital is defined and interpreted in different ways, and for the needs of this paper, a few will be quoted:

T. Stewart gives two definitions from 1991, "Intellectual capital is the sum of knowledge of all the people in the company, but the knowledge that contribute to competitive advantage in the market, too", from 1997, "Intellectual capital is intellectual material - knowledge, information, intellectual property, experience - that can be used to create wealth. This is the power of the collective mind."

According to A. Bounfour and L. Edvinsson (2005), "Intellectual capital is a combination of human (knowledge, creativity, innovation and ability) and organizational capital (knowledge, embodied in the hardware, software, databases, concepts, values, organizational structure and governance in organizations that support everyday work of employees) "[2].

Rapid changes, not only in terms of new technologies, discoveries, innovation and value systems, is of primary importance for the successful operation of business systems are more tangible material resources but also intangible resources of different nature. Intangible assets of a business system in the form of intellectual capital in the era of digital economy provide a competitive advantage over the competition. The total value of the business system are increasing share in recent years has the intangibles and the role of property in the creation of added value is decreasing.

The first chart shows the share of tangible and intangible assets in the total market value of the world's leading corporations since 1975 to 2010, source: Ocean Tomo.

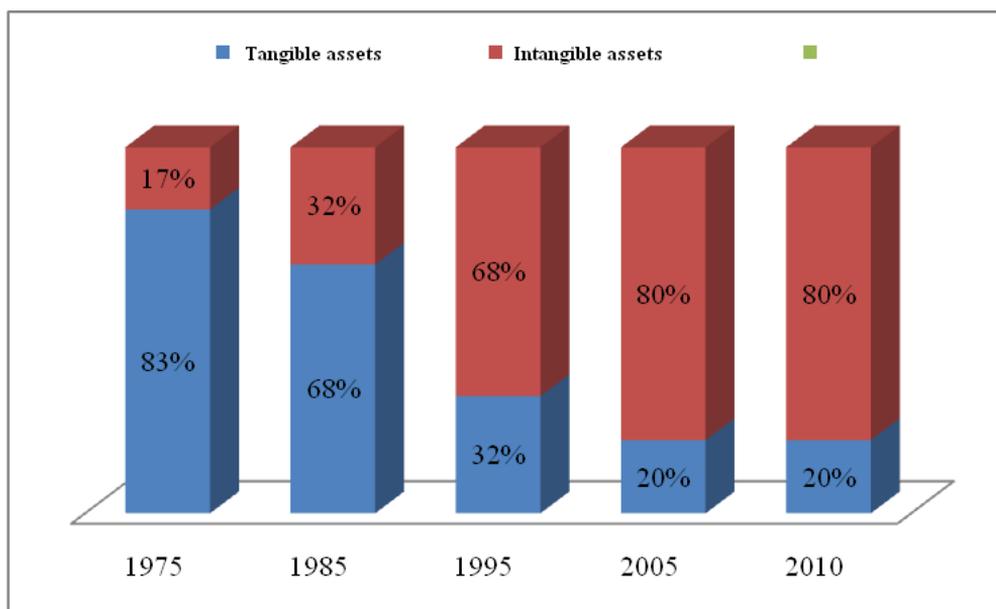


Figure 1 Share of tangible and intangible assets in the total market value of the world's leading corporations from 1975 to 2010.

Based on the first chart it can be concluded that the trend of increasing importance of intangible assets in total amount of value of global corporations is bigger and bigger in relation to tangible assets (properties, plants, equipment, inventory, financial assets), which is decreasing, and the main reason is the appearance of newly created knowledge that is created by knowledge, rather than material resources.

### 3.1. Classification of intellectual capital

In the literature on intellectual capital a number of different classifications can be found as follows:

- MERITUM (Nordic Industrial Fund, 2001): human capital, structural capital and relational capital,
- DIRECTIVES OF DENMARK (Nordic Industrial Fund, 2001): employees, consumers/customers, processes and technology,
- INTANGIBLE ASSETS MONITOR (Intangible Assets Monitor, 1997) - IAM: individual competencies of employees, capital, internal structure, and external capital structure,
- SKANDIA NAVIGATOR (Skandia Insurance Company, 1996): human capital and structural capital: consumer and organizational capital,
- SAINT-ONGE H, Wallace D: human capital, structural capital and customer capital,
- INTERNATIONAL FEDERATION OF ACCOUNTANTS, IFAC - human capital, relational capital, organizational capital: intellectual property and infrastructure assets, etc.

For the purposes of paper, we will briefly explain the most commonly used classification of intellectual capital (MERITUM) where intellectual capital is divided into the following structure:

- Human capital,
- Structural capital and
- Relational capital,

Human capital is defined as a set of knowledge (individual and general), skills, and experience of employees whose actions create new value for the business system. Human capital of the companies is made of management and employees and it includes creativity, innovation, know-how, motivation, satisfaction, responsibility, perseverance, initiative, criticality, loyalty, teamwork ability, flexibility and adaptability, self-study, education, etc.

Structural capital is a codified knowledge or resources that remain in the business system, when all employees leave a business system after working hours. Structural capital includes systems and organization, which provides that available resources of the business systems are used in an efficient manner. The resources of the structural capital encompass intellectual property of the business system (patents, licenses, brands, copyrights, software, databases, etc.) and organizational processes (business organization, organizational culture, information and telecommunication systems, strategies, ISO and HACCP standards, etc.). Structural capital is operationalized through the information system, software, skills, and experience that business system is built into business processes and systems.

Relational capital represents the resources of the business systems that have relations with the external environment (customers, suppliers, distributors, partners, etc.). Relational capital can be grouped into three categories:

- Business networks: sales networks, marketing networks, distributed networks, etc.
- Brand: creating the image of the business system, the realization of importance on the market, the ability to attract customers, creating value for customer, etc., and
- Consumers/customers: relation with customers, relationships with suppliers, relationships with investors, public relations, relations with partners, etc.

#### **4. RESUME**

For successfully business systems in the era of digital economy, and gaining and maintaining competitive advantage it is necessary to abandon the philosophy of "old economy" which was based on cheap labor, raw materials, energy, machinery, etc. and based business on new technologies, new business models , new products and new services. The pace of changes dictated by global competition, forces business systems to respond quickly to emerging changes and its structure and business models adapt to new situations. In order for business systems to be successful in the new business environment, must to continue to generate new knowledge, and distributing it through the application of modern information and telecommunication technologies to employees who will apply them in creating new values. Creating new values through successful implementation of intellectual capital, successful business systems efficiently and effectively use knowledge and information in order to achieve and maintain competitive advantages in different situations and changes dictated by the contemporary market.

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