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BUSINESS INTELLIGENCE AND INTELLECTUAL CAPITAL – CONCEPTS OF KNOWLEDGE IN THE FUNCTION OF ADDED VALUE CREATION

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ABSTRACT

Data, technology, human capital, and business intelligence tools are components without which the use of information in the decision-making process would not be possible, furthermore, in today's business conditions, it is immensely necessary and crucial. The large amount of data collected from both internal and external sources has the potential to take advantage of new business opportunities, but as well to increase the company value by applying business intelligence tools. On the other hand, the use of such data requires certain knowledge and competencies incorporated into intellectual capital. Companies strive to address unpredictability with the effect of invisibility. In this context, they rely on the knowledge and discover in it the most important economic resource which replaces traditional resources in the fight against everyday change. Being different means having the knowledge others do not have, having the information that allows a decision made based on it, place an anonymous company in the position of a leader. The paper aims to emphasize the importance and significance of knowledge as a component of business intelligence and as a component of intellectual capital. The target is to investigate, based on previous scientific research, the connection and in connection the significant role of business intelligence concept and the intellectual capital concept as a form of knowledge in creating added value.

Keywords: *business intelligence, intellectual capital, knowledge, added value*

1. INTRODUCTION

The theory of intellectual capital as a relatively new theory took exceptionally quick prominent place in the "world of economic theories". It attracted attention with the belief that future business results will increase if something intangible is applied, and yet available to everyone. The enrichment of companies, it observes through human capital, structural capital and consumer capital (Kolaković, 2003). It sees in them the future of growth and development of every company. Points to the importance of intangible assets as assets which are in most cases much more valuable than tangible ones, although they do not have their prominent place in the balance sheet. The thing certainly characterizes intellectual capital is its secrecy, intangibility, non-financial value, intangible form, difficult valuation. Something that is defined as intangible has formed a sure path to creating greater wealth and from something accessible and invisible has created a winning card in a challenging market competition. Today, being an enterprise that has not understood the value and importance of applying intellectual capital theory means being an enterprise with untapped knowledge. Such companies become "intellectually backward".

The knowledge that business decisions can no longer be made on the basis of intuition but on exact facts is the basis of the concept of business intelligence. It is about the support system and business decision-making support, which the business world considers a useful and extremely necessary concept of creating added value. Business intelligence is a concept of organized, systematic and legal collection, analysis and use of data and information obtained from them that provide the business decision-making process with useful knowledge for making better and more effective business decisions at all management levels in order to achieve business continuity (Luetić, 2017).

Intellectual capital combined with the application of business intelligence provides the knowledge necessary to create added value. These two concepts connect knowledge. While business intelligence seeks for knowledge and comes to knowledge, intellectual capital represents only the knowledge that creates added value.

2. CONCEPT AND CONTENT OF BUSINESS INTELLIGENCE

In order to avoid problems and obscurities in the use of the term business intelligence, and starting from the fact that it is a syntagm, it is necessary to analyze the terms of which the syntagm consists, determine the content of these terms and by the method of synthesis through content observation, determine the meaning of its term (Javorović and Bilandžić, 2007). Previously said proves the weight and complexity of the concept of business intelligence. The

information, organization and activity are hidden under the term *intelligence*, with its fundamental meaning being intelligence. When the term intelligence, which is translated into Croatian as "intelligence", is connected with the term *business*, which is translated as "business", business intelligence in the broadest sense of the word, represents intelligence activity in the business world.

Business intelligence arises from the framework of intelligence (reporting) activity. Javorović and Bilandžić (2007) in Business Information and Business Intelligence book, state the chronology of the emergence and development of the concept of business intelligence starting from the first Biblical records of the Israeli conquest of Palestine around 1200 BC, through Sun Tzu and his book The Art of War, and all until the 20th century when the British established a high-quality system of intelligence in the economy which allowed them to control the economy of individual states. Finally, in 1959, as a consequence of the establishment of a new form of intelligence activity in the business environment, the concept of competitive intelligence was formed, on the basis of which business intelligence developed in the 1990s. Competitive intelligence has been used for years as a tool in the business decision-making process to discover the operation of the market and the position of the company in it. It represents the legal and ethical collection and data analysis for the purpose of creating its own business goals and strengthening competitiveness.

Business intelligence has been defined by numerous researchers. Howson (2008), Fleisher and Bensoussan (2007), Pettit (2008), Taskov (2009) interpret it as a process, Panian and Klepac (2003), Hannula and Pirttimaki (2003), Williams and Williams (2007), Isik (2009) as a concept, Hwang and Cappel (2008) as a discipline, Kalakota and Robinson (2002), Liataud and Hammond (2006) as a strategy, Li (2008) as a set of applications, Javorović and Bilandžić (2007) as a business intelligence activity, Fleisher and Bensoussan (2003) as a value-added product, Oreščanin (2003) as a way of business thinking, Hugos (2006) as a system, Parttimaki (2007) as a managerial philosophy (Luetić, 2017). But what certainly represents business intelligence for a company is a new and specific form of company management, which ensures the creation of added value to the company. Luetić (2017) concludes that business intelligence is a concept of organized, systematic, legal, legitimate and ethical collection, analyzing and use of data and information obtained from them that provides useful knowledge to the management function to make more efficient, faster, better quality and more effective business decisions at all management levels in the function of achieving continuity of business sustainability and a higher level of competitiveness.

The term business intelligence first appeared in 1989, and its origin is linked to Howard Dresner, who concluded that intuitive decision-making is

not effective and that the whole decision-making process should be based on exact facts (Javorović and Bilandžić, 2007). It is a term that has been used on a global scale only since 1992, a term whose content many experts and scientists disagree on (Javorović and Bilandžić, 2007).

The generally accepted definition of business intelligence has not yet been established. But that is why many researchers, experts and scientists have given their definitions proposals and there are many of them indeed. Vernon Prior (1993), Benjamin and Tamar Gilad (1998), Humbert Lesca (1994), Luetić (2017), Javorović and Bilandžić (2007) are just some of those researchers and scientists who have contributed to setting of its definition.

Scientists and experts who were among the first ones who gave their personal contribution to introducing the Croatian profession to the concept of business intelligence are certainly Javorović and Bilandžić (2007). They defined three features of business intelligence as intelligence activities in the business world. First, they define business intelligence as the process of collecting data and information that, after proper processing, becomes knowledge. Second, they believe that business intelligence is focused on information on the basis of which future processes, events, actions or movements can be anticipated. And third, they observe business intelligence as an instrument that has a supporting role in the decision-making process.

The first research (Thierauff, 2001; Hannula and Pirttimaki, 2003; Williams and Williams, 2004; Lonnquist and Pirttimaski, 2006) in terms of the effect of applying the concept of business intelligence showed mostly non-financial effects such as increasing the quality and timeliness of information (Luetić, 2017). Some later research (Stubs, 2011) indicates that the application of the business intelligence concept has financial effects (Luetić, 2017). The link between the quality of business decision-making and the successful application of business intelligence tools was confirmed by those companies that with successfully implemented business intelligence tools and their daily use defined the basis for business decisions which resulted in positive results in terms of profitability, competitiveness, efficiency and had better insight into the threats and opportunities of your business environment (Dukić et al., 2016). In 2004, the Massachusetts Institute of Technology in a survey of a sample of 4.500 managers found that the proper application of business intelligence increases the efficiency of decision-making, ie reduces the risk of making bad assessments and wrong decisions (Bilandžić and Mikulić, 2007). In November 2001, the prestigious Business Week reported that those companies which use business intelligence achieve revenue growth of up to 20% faster than companies that do not use such an option in their business (Javorović and Bilandžić, 2007).

3. HISTORY, DEFINITION AND COMPONENTS OF INTELLECTUAL CAPITAL

Numerous economists have dealt with the development of the concept and theory of intellectual capital, of which Kolaković and Sundać could stand out in Croatian circles. Kolaković (2003), based on research and analysis of previous knowledge, concludes and thus warns of a possible misunderstanding of the stronghold of the theory of intellectual capital, stating that at first glance it has a foothold in managerial and organizational theories, but actually relies on macroeconomics. Sundać et al. (2016) assume that the concept of monitoring business on intellectual capital is relatively new, has the macroeconomic foundations and that for this reason it is necessary to begin a theoretical analysis of the concept of intellectual capital with Solow's model of neoclassical growth theory. The model is a set of formulas that determine the most effective combinations of traditional factors: land, labor, and capital. Solow's starts from the assumption that growth begins to slow and finally stops when the combination of land, labor, and capital approaches the most efficient combination.

Paul Romer stands out as the biggest critic of Solow's model. It is an economist who occupies a prominent place in the development of the concept of intellectual capital. He proposes a model according to which the accumulation of knowledge at all levels is essential for economic growth (Kolaković, 2003). His model is based on the division of the world into two parts - physical objects and ideas. He emphasizes the crucial role of ideas in economic growth because facilities are scarce and subject to the law of declining yields, while humans possess an almost infinite capacity to reshape the physical nature by creating new recipes for their use (Sundać et al., 2016). The model became known as the new growth theory or endogenous growth theory. He concludes that in today's changing business conditions, the company will have a chance to survive and grow if it takes care of having adequate stocks of human capital.

Romero's connection of the hitherto known theory of human capital with the ideas and innovations that human capital must produce, according to many, defined him as the founder of a new field of research – the concept of intellectual capital (Kolaković, 2003). He encouraged the study of intellectual capital by scientific researchers around the world. They studied intangible assets independently of each other. When their views are summarized, we come to three different sources or three different schools, ie three independently developing trends from which the concept of intellectual capital developed. The first source developed in Japan. For this reason, it is known as the so-called. Japanese school. Hiroyuki Itamiem is considered the founder and leader. This source was focused on the study of knowledge management. Another source of concept development and the emergence of intellectual capital theory is

led by theorists Penrose, Rubin, Rumelt and Wernerfelt (Kolaković, 2003). It was geared towards a theory based on resource efficiency. The third source or third trend important for the development of the concept of intellectual capital is focused on the study of human capital. Gary Becker is considered to be at the forefront of this trend. With his book Human Capital, he defined the theory of human capital as activities which increase business opportunities by developing the most valuable capital – people (Kolaković, 2003). In more recent times, in Sweden, Karl-Erik Sveiby as the founder of the so-called. Swedish schools in knowledge management and the study of intellectual capital, leaves a special contribution to the development of the concept of intellectual capital. He recognized the need to measure human capital and advocated accounting monitoring of this form of intangible assets.

The development of intellectual capital as an economic category took place in the 1990s. Then economists came to the conclusion that the value of a company's physical assets differs from its market value, and thus came to the conclusion that there must be another invisible and intangible value. Thomas A. Stewart[1] is cited as the first economist to discover this and who with this discovery started a seemingly real revolution in the field of knowledge management. He defined intellectual capital as the sum of everything that everyone in the company knows and as the basic competitive advantage in the market. First, his work stimulated great interest in the thorough and continuous study of knowledge, and second, he influenced the development of the concept of intellectual capital. Stewart reveals that today's companies, by applying the concept of intellectual capital in everyday business, drastically increase the business result in the market and achieve millions of dollars in savings (Sundać et al., 2016).

Nowadays, information and knowledge are more valuable than ever before. Knowledge not only creates value, but also new knowledge (Kolaković, 2003). The rules of the game in the business world have gained a new dimension in which the creation of value means the creation of new knowledge in the form of intellectual property without the physical property that becomes the basis of growth and development of the enterprise. In today's business environment, a company survives because of what it knows, not because of how much it has. Intellectual capital has become the most valuable form of capital that exists in the business world today.

1 Thomas A. Stewart as the editor of Fortune magazine in 1991 wrote the first article on intellectual capital in the professional literature. He published an article in Fortune magazine entitled *Brainpower – How Intellectual Capital Becoming Americas Most Valuable Asset*. The article aroused so much interest among economists that it prompted them to explore a concept that had developed into a theory. One exceptional piece Stewart is considered to be the most prominent economist in the analysis of the concept of intellectual capital and the economist who paved the way for the development of the theory of intellectual capital.

Intellectual capital is a relatively new and complex economic category which encompasses all those factors that create added value in a company and that affect the long-term profitability and competitiveness of the company, and are not clearly expressed in traditional financial statements. It is an economic category that is not given as much attention today as it should be. In many companies, is is still seen as a cost rather than a development capital and investment. Often it is avoided due to the impossibility of easy measurement and bookkeeping.

First and foremost, intellectual capital should be seen as part of the company total capital. It is a form of hidden or invisible property, it is an intangible resource which is not clearly expressed in the accounting records. There is no place for it in the balance sheet. It contains both tacit and explicit knowledge that is within the company. Such forms of knowledge are the key to a company's competitive advantage. The essence of intellectual capital are people. People possess knowledge that creates new or added value in terms of intellectual capital. It is the knowledge of a company's investment which creates new value through the optimal use of other resources.

According to Prusak, intellectual capital represents intellectual material, which is formalized, retained and distributed in the production of added value (Sundać et al., 2016). Stewart, on the other hand, describes intellectual capital as something intangible that creates wealth (Sundać et al., 2016). He views it as all organizational patents, processes, employee skills, technologies, customer and supplier informations with added experience, individually accumulated knowledge and know-how as a source of innovation and regeneration, as well as ability, skills and expertise built into the human brain (Sundać et al., 2016). He describes intellectual capital both as knowledge and as information and as intellectual property and as experience. Everything that makes intellectual capital according to him, is in the function of creating wealth.

According to Sundać et al. (2016) who uses intellectual capital rules the world. The authors claim, as knowledge of modern companies grows that the success of their business is not measured solely by the created mass of tangible assets, but by the ability of companies to effectively create as much newly added value.

4. BUSINESS INTELLIGENCE AND INTELLECTUAL CAPITAL – CONCEPTS OF KNOWLEDGE IN THE FUNCTION OF ADDED VALUE CREATION

Constant, rapid and unpredictable changes at all levels require new ways to adapt. In modern conditions, and especially those of globalization, inno-

vation and newly created knowledge as a result of research is not only the foundation of development but also a key factor in society (Jakovac, 2012). Today tangible material assets are being replaced by intangible invisible assets. Invisible assets like knowledge and information form the basis of intellectual capital which today is the key to faster growth and development of any business. To have the knowledge and to have the information's which can be used for the purpose of achieving any increased value and some kind of advantage, it means knowing how to use invisible knowledge and shape it into wealth-creating capital. This reveals a clear link between the concept of intellectual capital and business intelligence. Knowledge is necessary in the application of business intelligence, while intellectual capital possesses that necessary knowledge, which only confirms their much-needed connection.

Effective data and information management ensures the company makes effective strategic, tactical and operational decisions, but also implies radical changes in the concept of business thinking and functioning, given the importance and amount of information, flow rate and interconnection and conditionality (Luetić, 2017). Precisely this means how business intelligence and intellectual capital make up knowledge and how the knowledge is their basic element which forms a continuous link between these two concepts. In a typical company, we have at our disposal 90% of the necessary data and information necessary for efficient business, of which only 10% use it efficiently (Liautaud and Hammond, 2006). From the previous one, the necessity of connecting the concept of business intelligence and intellectual capital is clearly visible. It is here where business intelligence tools appear as a solution, which through knowledge in their application and through knowledge to collect, process and use data hides intellectual capital. Therefore, business intelligence should enable the company to use the remaining 80% of valuable data crucial for efficient business through knowledge made in intellectual capital.

Intellectual capital represents the value of knowledge, skills and information that employees or the company itself can provide in creating added value for the company. It is focused on gathering the knowledge hidden in all the information that is available to the company and which is the driver of improving its business. Spending time and money on anything is a big deal, but spending time and money on the knowledge, expertise and training of your staff is becoming necessary and invaluable today. Therein lies the intellectual strengthening of the enterprise in its mental sense of the word.

To have information means to have the knowledge. To have the knowledge means to have invisible capital. To have invisible capital means to possess intellectual capital. To possess intellectual capital means to be an information and intellectual enterprise or enterprise of a knowledge. Information has al-

ways been crucial to a successful business. Today they are available at every turn. They are available now and always. Information ensures the acquisition of new knowledge and insights. It is information which reduces the difference between what is not known and what is known.

Widhiastuti et al. (2018) in their research strive to analyze the existence of a positive impact of business intelligence and intellectual capital in increasing the value of a company. The survey was conducted on a sample of 41 companies and used the annual financial statements as secondary data sources. The results of the research showed that business intelligence and intellectual capital greatly affect the value of a company. They found that business intelligence and intellectual capital as components of the business decision-making process are well managed, allowing all decisions to be made quickly, accurately and efficiently and at low cost. They also link the success of the company with the skill and ability of the company to find opportunities and neutralize threats to the greatest possible extent through the application of information which today is a basic tool in achieving a competitive advantage. They conclude that in addition to business intelligence, it is important to pay special attention to intellectual capital as a resource which increases the value of the company.

Ratia (2018) addressed the issue of business intelligence tools and intellectual capital in value creation in the Finnish private health sector. She came to the conclusion that decision-making in the private health sector is increasingly based on data, both internal and external. However, she believes that the use of such data requires a certain level of ability and knowledge hidden under intellectual capital. It defines intellectual capital tools as frameworks for data review, while it defines the role and use of business intelligence tools as frameworks for value creation. This research provided a better insight into the understanding of value creation using intellectual capital and business intelligence tools in the Finnish private health sector. In the research, various data sources and business intelligence tools are considered as part of structural capital, while the use and ability to use them is observed through the dimension of human capital. It concludes that the Finnish private health sector is changing rapidly and is therefore looking for some new and better ways to improve performance. New and better ways of decision-making are especially being sought.

Decision based on data, while the application of data depends on intellectual capital, because it is new dimension which is incorporated in the use of business intelligence tools. Research has shown that structural and human capital play a significant role in creating data crucial to increasing the value of private healthcare organizations, but that existing organizational skills or competencies in business intelligence use do not meet current organizational

ambitions, which imposes the need to seek competencies in the use of business intelligences tools in external sources. It is concluded that external data combined with available internal organizational data can potentially create new business concepts and that the advanced use of different data sources, both internal and external, can enable the creation of new data and improve business decision making (Ratia, 2018). Human capital or capability is needed not only in terms of using business intelligence tools, but also to improve strategic decision-making based on available data.

Today, external data is defined as drivers of increasing organizational values. Data itself has no value, so intellectual capital has a significant role in defining that value which allows something that cannot be used at first, become the basis for making the best business decisions. Because internal and external possibilities can be involved, knowledge sharing plays an important role. Ultimately, the practical outcome of this research provides insight into the role of structural and human capital in creating data fundamental to increasing an organization's value.

5. CONCLUSION

In order to discover hidden knowledge in a company as quickly as possible, which can contribute to increasing its value and competitiveness, it is necessary to establish a link between the concept of business intelligence and the concept of intellectual capital. The success of a business never comes by itself and cannot be the result of mere coincidence. Success comes with fast and quality decisions which arise when the quality information is used in a quality way. Therein lies the link between the concept of business intelligence and intellectual capital. Business intelligence finds quality information, while intellectual capital represents the knowledge and ability to exploit such information in the business decision-making process. There is a close connection between the two concepts. Combined, these concepts provide the company with much more than they can individually do. Intellectual capital possesses the knowledge, and business intelligence provides the opportunity to apply the knowledge, but also the opportunity to gather knowledge in the form of information. Not understanding the importance of combining business intelligence and intellectual capital in today's turbulent changes means lagging behind the competition, not applying tools to increase company value, and condemning oneself to an uncertain future.

The extent to which business intelligence and intellectual capital offer the business decision-making process can be seen through a simple example of the application of Excel and its collection, processing and analysis of data by people as carriers of knowledge of human capital. Excel as a leading spread-

sheet program is an extremely simple but powerful tool for visualizing and analyzing data. Its presence is recorded in almost every company and its presence of the company possesses a simple and effective business intelligence system which creates added value. Through its smart features, Excel learns the work patterns of each company by organizing time-saving data with the ability to create various spreadsheets and perform calculations with formulas with the help of templates, but also to display data in a visual way such as diagrams and graphs, which allows a better understanding of the available data. Based on the available data through this software tool in just a few steps you can get data on forecasting future trends, which indicates that Excel is first a database, and secondly a data processing tool for obtaining quality information necessary for the business decision-making process. Higher quality and more secure development that ensures each process of data collection and processing, also ensures the creation of added value of the company, which through Excel as one of the most accessible, simplest and cheapest software tools is indicated in the application of business intelligence. However, the application of Excel depends on the knowledge and ability to use such program and to obtain information from it, which as such can be used in the business decision-making process. Ultimately, one concept without another does not work.

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BUSINESS INTELLIGENCE I INTELEKTUALNI KAPITAL – KONCEPTI ZNANJA U FUNKCIJI STVARANJA DODANE VRIJEDNOSTI

SAŽETAK RADA

Podaci, tehnologija, ljudski kapital i alati business intelligencea komponente su bez kojih upotreba informacija u procesu odlučivanja ne bi bila moguća, štoviše u današnjim uvjetima poslovanja je prijeko potrebna i presudna. Velika količina podataka koja se prikuplja kako iz unutarnjih, tako i iz vanjskih izvora potencijal je da se iskoriste nove poslovne prilike, ali i da se poveća vrijednost poduzeća i to primjenom alata business intelligencea. S druge pak strane, korištenje takvih podataka zahtjeva određena znanja i kompetencije ukomponirane u intelektualni kapital. Poduzeća nepredvidivost nastoje riješiti s efektom nevidljivosti. U tom se kontekstu oslanjaju na znanje i u njemu otkrivaju najvažniji ekonomski resurs koji zamjenjuje tradicionalne resurse u borbi sa svakodnevnim promjenama. Biti drugačiji znači imati znanje koje drugi nemaju, imati informaciju koja omogućava da odluka donesena na temelju nje anonimno poduzeće postavi u poziciju lidera. Radom se želi istaknuti važnost i značaj znanja kako kao komponente business intelligencea, tako i kao komponente intelektualnog kapitala. Cilj je istražiti na temelju dosadašnjih znanstvenih istraživanja povezanost i u povezanosti značajnu ulogu koncepta business intelligencea i koncepta intelektualnog kapitala kao oblika znanja u stvaranju dodane vrijednosti.

Ključne riječi: *business intelligence, intelektualni kapital, znanje, dodana vrijednost*