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INTELLECTUAL CAPITAL AND LEADING INFORMATION TECHNOLOGY TRENDS AS COMPONENTS OF A MODERN COMPANY DEVELOPMENT¹

Intelektualni kapital i vodeći trendovi u informacionim tehnologijama kao komponente razvoja savremenog preduzeća

Abstract

The purpose of this paper is to present the significance of intellectual capital and information technology for modern business and society as a whole. The intellectual capital of an organisation is part of its total value. It consists of all intangible assets and processes. As such, it is very important for the proper functioning and survival in the market. The importance of intellectual capital has been emphasised before, but the 21st century is the time when this phenomenon is reaching its full potential. Intellectual capital is directly related to technological development and it represents the most important development resource, nowadays. It is very important to emphasise the importance of knowledge and learning, as well as the phenomenon of the learning organisation. The tendency towards globalisation generally requires open organisational forms, based on modern technology, modern knowledge and the monitoring of contemporary trends in information technology (IT). Information technology is developing faster than ever. It takes many forms and pervades many social and economic relations. That is why it is important to keep up with it, to analyse its trends, to foresee its future developments.

Keywords: *intellectual capital, knowledge, learning organisation, human capital, information technology, business.*

Sažetak

Cilj ovog rada je da prikaže značaj intelektualnog kapitala i informacionih tehnologija za savremeno poslovanje preduzeća i društvo u celini. Intelektualni kapital neke organizacije predstavlja deo njene ukupne vrednosti. Sastoji se od svih nematerijalnih sredstava i procesa. Kao takav, veoma je važan za pravilno funkcionisanje preduzeća i njegov opstanak na tržištu. Poznato je da je i ranije bio naglašen značaj intelektualnog kapitala, ali 21. vek je vreme kada ovaj fenomen dostiže svoj puni potencijal. Intelektualni kapital je u direktnoj vezi sa tehnološkim razvojem i danas predstavlja najznačajniji razvojni resurs. Autori u radu naglašavaju važnost znanja i učenja, kao i fenomena organizacije koja uči. Tendencija globalizacije generalno zahteva otvorene organizacione forme zasnovane na modernoj tehnologiji, savremenom znanju i praćenju savremenih trendova u informacionim tehnologijama (IT). Informacione tehnologije se razvijaju brže nego ikada i prožimaju mnoge društvene i ekonomske odnose. Zato je važno pratiti i analizirati trendove informacionih tehnologija u biznisu, kao i predvideti pravce budućeg razvoja.

Ključne reči: *intelektualni kapital, znanje, organizacija koja uči, ljudski kapital, informacione tehnologije, biznis.*

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Introduction

Today's business environment is very complex. In such an environment, knowledge becomes the most important development resource. Traditional factors of production (land, labour, and capital) have not disappeared, but increasingly become secondary ones. In other words, they can easily be acquired if there is a strong intellectual capital. The total value of the company is a sum of financial capital and intellectual capital. The financial capital incorporates all tangible and monetary assets, while the intellectual capital consists of all nonmaterial, intangible assets and processes of the company. The company's intangible assets include: experience, information, know-how, managers' readiness, brand, image, reputation, culture, consumer loyalty, trust, knowledge of consumer preferences and the ability to process information. Technological development is directly related to the intellectual capital i.e., the human factor, because it is the most important development resource nowadays. Investing in the intellectual capital development is a global tendency, because the 'civilisation of knowledge' is important for all countries, regardless of their development level.

Scientific and technological development and high level of employment require appropriate human potential, i.e., knowledge that can achieve the integration of economic and social development. In this millennium, the global environment has the following features: globalisation, computerisation, rapid technological obsolescence, market variability, increased customer sophistication, increased international cooperation, discontinuity and development of the postmodern culture. The turbulence of the external environment of the company is emphasised, although turbulences can be internally generated as well, primarily by innovations. Such a trend is expected in the future.

The role of knowledge and intellectual capital in the modern economy

As the first step in knowledge accumulation, the educational system has a prominent role in adapting to the development requirements. This means that education in the traditional sense is not enough. Speaking of the new concept of organisation, Drucker (1992) says 'It is the very nature of

knowledge that it changes fast and that today's certainties will be tomorrow's absurdities'. An organisation must include change management in its development strategy. In addition, innovativeness must be organised and streamlined in a modern organisation. A modern organisation consists of knowledge specialists, which means that it must be an organisation of equals, not the organisation of superiors and subordinates [6].

The power of a modern, global company is increasingly contained in the intellectual and cultural performance of the company, rather than in traditional, tangible assets. So it is true that the future belongs to those who have knowledge. A key figure in the organisation is a knowledge specialist, i.e., a modern manager who knows how to use knowledge for productive purposes [6]. The managers' knowledge is a prerequisite for the efficient use of existing and future resources. Knowledge is increasingly recognised as essential for successful implementation of the technological development strategy, for business survival and development, as well as for dealing with changes. One of the basic goals of the scientific and technological development policy is the new knowledge creation, transfer, mastering and diffusion. The purpose of learning is to increase knowledge or to achieve a higher level of existing skill. In this regard, learning relates to a relatively constant change in behaviour that arises as a result of experience or practice.

There is significant evidence that different forms of intellectual capital such as knowledge, skills, talent, enthusiasm, patents, know-how, software, databases, close customer relations, brand, unique organisational design, and corporate culture determines a company's potential for growth and generates the majority of its added value [23, p. 352].

However, in the case of 300 top performing Serbian companies in terms of export, the significant impact of intellectual capital on financial performance was not determined [22, p. 329].

The knowledge-creating company

The progression of knowledge in terms of intellectual learning is achieved through a social process that is largely

focused on maximising the collective know-how. In this regard, the current concepts are 'knowledge-creating company' and 'learning organisation'. Japanese authors point to the importance of the so-called tacit (implicit) knowledge. In their opinion, management theorists in the West see knowledge as explicit, formal and systematic. Tacit knowledge is the essence of knowledge in an organisation. It cannot be easily seen and expressed. It is very personal and difficult to communicate. This category of knowledge includes intuition, subjective insight and speculation [14]. The distinction between explicit and tacit knowledge is the key to understanding the difference between the Western and Japanese approaches to knowledge. Explicit knowledge can be easily processed by computer, electronically transferred or stored in a data bank. On the other hand, there is no systematic and logical way for transferring tacit knowledge. Therefore, it is necessary to translate tacit knowledge into words and numbers, so that everyone can understand it. Organisational knowledge is created just at the time of the conversion of tacit knowledge into explicit one, and back into the tacit knowledge. Knowledge is always the property of an individual, and in order to become organisational, internalisation is necessary. When most employees share created mental models, tacit knowledge becomes part of the organisation culture [13].

Successful companies are those which continually create new knowledge, which is rapidly expanded in the organisation and quickly emerges in new technologies and products [18]. This approach means that every employee is responsible for creating knowledge. It is important to transform personal knowledge of an individual into organisational knowledge, from which the company benefits. Thus, an organisational knowledge creation refers to the ability of the company as a whole to create new knowledge and to expand it in the organisation, which is embodied in the products, services and systems. Knowledge creation takes place in three levels: individual, group and organisational.

The market uncertainty requires searching for new knowledge that is created outside the company. The knowledge acquired externally must be quickly expanded to become the basis for the creation of new products and technologies. This is some sort of conversion from

the outside to the inside and again to the outside (in the form of new products, services and systems). The logical order is as follows: creating knowledge→continuous innovation→competitive advantage.

The learning organisation

In the beginning, the concept of learning organisation was used by some large companies in the United States. This concept is linked to the management efforts to create innovative companies. In fact, management is increasingly focusing on creating an atmosphere which stimulates learning. In complex companies there are many learning processes, and each individual and group has a knowledge base and learning abilities. In particular, such a concept is adopted by organisations wanting to keep up with current market and technology changes and perceiving the need for transformation.

Learning is a basic premise for developing the organisation's core competences. Some authors suggest three strategies for improving the organisation's ability to learn: improve learning orientations; improve facilitating factors; change both learning orientations and facilitating factors [15].

When it comes to a company, learning is both a process and an outcome. The learning organisation is a company which purposefully creates a structure and strategies and improves and maximises the learning of an organisation. Such organisations are beyond the separation between thinkers and doers. The focus is on integral thinking and actions at all levels in the organisational structure of the company [5]. Learning also involves taking time for reflection and analysis, for reviewing strategic options, exploring consumer needs, assessing the existing work system, and finding new products. In this learning process, it is necessary to stimulate the exchange of ideas through project teams and meeting with consumers (suppliers). Learning is actually investing in human resources as a part of intellectual capital i.e., intangible assets and can be incorporated into the 'goodwill' item in the balance sheet. It becomes the most important factor of achieving a relatively permanent competitive advantage in the global economy. However, it is necessary to distinguish concepts

of 'organisational learning' and 'learning organisation'. In the first case, it is about training employees in the company to acquire knowledge about interpersonal relations, above all. In the learning organisation, people acquire knowledge and expertise in their day-to-day work. In such an organisation, individuals continuously expand their capacity in order to achieve the desired results; it builds a new, more flexible way of thinking; collective aspirations are freely defined; and people continually learn how to learn together.

The learning organisation has processes for knowledge diffusion through the organisation where it is needed and for knowledge transformation into a new way of business operating [20, p. 94]. In such organisations the emphasis is on systems thinking. Systems thinking are necessary when people want to create common vision, mental models and teamwork and to enhance personal abilities. The personal influence of each individual is very important [20, p. 59].

Although the learning organisation takes place through employees, it is not just a sum of knowledge of existing employees. Learning is considered to be neither deterministic nor random. One part of learning is based on the experiment and the other one is based on the understanding of existing knowledge [11, p. 94]. In today's economy you have to learn faster than your competitors.

Intellectual capital and change management

Intellectual capital is focused on company's functioning in the changed future conditions and on seizing the external opportunities. People generate capital for the companies through their competences, attitudes and intellectual engagement. Competences as a component of human capital include: knowledge, skills, talents, and know-how of managers and employees. Particular attention should be paid to core competences development as critical and recognised strengths. In order to be characterised as core competences, resources, skills and capabilities should enable the access for the company to a wide variety of markets and customers, while at the same time being sufficiently unavailable for imitation by competitors. In the transformation process some competences can be improved, which requires additional investment. On the

other hand, some competences are abandoned to free up the necessary resources. In identifying new core competences, it is necessary to combine capabilities in the company, as well as to exchange knowledge, experience and information. In change management, the attitude of employees and their willingness to use their skills and abilities to make a change are very important. Also, the role of leaders is significant, i.e., the motivation of employees to achieve goals regardless of possible obstacles.

In order to survive and be competitive in the knowledge society, the economies need to learn how to manage their intellectual capital. Innovative companies form knowledge management teams and professional organisers hold workshops and conferences on knowledge management. 'An information society' and 'the knowledge economy' are the long-anticipated phenomena and now they are a reality. Leading management theorists argue that it is more cost-effective for a company to invest in its intellectual capital than in material resources. Often the value of the company's intellectual capital is several times higher than the value of its tangible assets. Balance sheet provides a review of the company's property at a certain moment. However, most executives would be confused if they were asked to show items representing the value of their company's intellectual capital. Earlier this value was known under a common name – goodwill. In order to realistically show the value of knowledge and skills of highly trained personnel, together with other factors such as customer relations, business reputation of the company and its information technology, a special system of indices is used. Further, it is necessary to create a diagram known as 'navigator' in order to show the relationship between company's strategic trends and the variables chosen to reflect its intellectual capital.

Techniques and tools for managing the traditional factors of production (labour, capital and land) have been progressively improved. In terms of professional tools for managing intellectual capital, virtually no progress has been made. As a consequence, companies often insufficiently use their intellectual resources. Knowledge is structurally very complex in environment in which companies operate today. The following trends are responsible for this: extremely high knowledge growth rate; the extent to

which knowledge has become fragmented; and increasing globalisation of knowledge.

Many companies perceive the increasing complexity of knowledge in the environment as a threat. However, there are many ways in which dynamic knowledge development can create new chances for the competition. In order to survive in a volatile market, a company must keep up with information technology (IT) trends.

Leading trends in information technology in business

The importance of information technology (IT) in modern business is enormous. Advanced economies accounted for 85–88% of the global top 1% in 1988–2005, falling to 77% in 2012. There was a decline in global inequality from 2005 to 2012. Global wealth data show rising participation of emerging economies in the global elite [1, p. 111]. The tendency towards globalisation generally requires open organisational forms, based on modern technology and modern knowledge [12, p. 7]. Recent research has recognised that technological factors are not the only key to the effectiveness of the Internet/e-business technologies acceptance [8, p. 9]. Research findings confirm that the basic factors of an online trust model are: website usability, privacy, security, expected product performance, loyalty, and electronic management of customer relations [19, p. 131].

The results in the study of financial performance of 594 enterprises that operate within the ICT industry in Serbia in the period of five years (2009–2013) and their dependence on ICT efficiency indicated that human capital and physical capital partially affect financial performance, which is consistent with empirical findings from other developing countries. When compared to other industries in Serbia, ICT industry demonstrated more significant impact of human capital [24, p. 348].

Artificial intelligence, machine learning, business intelligence and analytics and the Internet of Things

Business intelligence and analytics (BI&A) as a part of big data analytics has become increasingly important over the past two decades in both the academic and the

business communities. BI&A is based on data processing techniques and analytical technologies. BI&A includes business-centric practices and methodologies that analyse critical business data for a company to better run its own business and for better market positioning. Business intelligence and analytics technologies rely on business-oriented statistical analysis and data mining algorithms. In data mining algorithms, the intelligent methods are used including classification, cluster analysis techniques, statistical models, and vector networks analytics in order to extract data patterns. Statistical machine learning (ML) is based on fundamental concepts of statistics and probability and learning algorithms techniques such as Bayesian model, hidden Markov models, support vector machine, reinforcement learning, and ensemble models [3, p. 1165].

Artificial intelligence (AI) is the field of computer science designed to solve cognitive problems commonly associated with human intelligence, such as learning, problem solving, and pattern recognition. AI is defined as a system's ability to correctly interpret external data, to learn from such data, and to use learning to achieve specific goals and tasks through flexible adaptation [10]. Applications of AI in business management include: fraud detection, spam filters and prevention for online transactions, smart searches, smart business decision-making, content personalisation as a service, smart virtual personal assistants to provide real-time support to users, smart devices to predict customer, predictive customer service, estimating customer profile, data analysis and customer segmentation, dynamic price optimisation, process automation by integrating industrial robots into workflow or automatically route service requests, sales and business forecasting, social semantics, etc. [17].

ML is concerned with the development of algorithms and techniques that allow computers to learn and discern patterns and predict future outcomes based on historical data. ML has a wide spectrum of applications including: stock market analysis, detecting credit card fraud, search engines, speech and handwriting recognition, analysing various kinds of data in many areas including business and management, etc. ML is promoting some products and financial services to the best customers on the Internet like Facebook and Amazon.

Amazon.com builds its operations on IT infrastructure and machine learning-based systems, simple-to-use and powerful tools and services, thereby improving its business and creating satisfied customers around the world by reducing their operating costs. While BI focuses on reporting past business data, ML predicts future outcomes based on past trends and transactions. Successful implementation of ML in a business implies in the first phase: problem identification, data collection and model creation. In the second phase, ML model is tested and applied on a specific business system in terms of prediction of business decisions, with possible correction until the desired prediction level is reached.

The term Internet of Things (IoT) in the business segment implies the installation of various sensors and their connection, in order to obtain the function of recognition, monitoring and management in systems. There is a link between IoT and marketing today via advertisements tailored to a particular customer on social networks, where companies use social network statistics to adjust their offer. In the future every customer will be viewed as a market for himself and he will be offered a personalised promotion. In order to achieve this, it is necessary to collect all consumer activities on a daily basis. Every house-consumer would have sensors for continuous data acquisition and the central database would further generate the customer as an object for adjusting promotion. The goal is to use real-time analytics in order to enhance customer loyalty through delivering highly targeted, relevant and personalised solutions at every moment, by providing innovativeness, scalability, speed and efficiency. Protecting both private and business information collected from unauthorised users, such as current location, credit card number or any other confidential content online, will be of the greatest importance in the future for the IoT development and its further implementation in the business.

Live interactions over social media

Social networks have replaced the traditional media. Experiences from all over the world indicate the increasing role of platform use in marketing [2, p. 153]. Decision

makers try to identify ways in which firms can make profitable use of applications such as Wikipedia, YouTube, Facebook, LinkedIn and Twitter [9, p. 59].

Live streaming video content will be the emerging trend. Regardless of the great popularity of social networks, top world companies recognise the importance of live interaction between people and do not use technology to replace the need for these interactions. Smart companies use the fact that customers are connected to each other virtually through social networks, but live interaction makes business connections more valuable and stronger.

Live streaming video content is a necessary component of successful businesses. Video is the most viewed content, and live video is the most effective way to connect with the consumer in real time in a sincere and personal manner. Companies create live streaming in order to establish real-time connections with their audience, and live videos (Live stream) become an integral part of the marketing strategy for any business. Companies that plan and develop video marketing resources will dominate the future market.

Generation Z

Children of this generation (born in 1995-2012) grow up in a highly sophisticated society and computer environment. Their life is characterised by widespread use of the Internet, mobile technologies and social networks. However there is a question: whether the Generation Z is characterised by complete connectedness or absolute loneliness, caused by the expansion of the Internet and social networks?

According to the Northeastern University survey, 81% of the Generation Z believes that obtaining a degree at a university is necessary for achieving a full career potential. According to the survey, 63% of the respondents, all between the ages of 16 and 19, said they want to learn about entrepreneurship in college, including how to start a business [16].

So, Generation Z is the first generation 'born with gadgets in their hands' and totally different from previous generations. Smart companies and brands are doing serious research in order to understand members of this generation as future employees and consumers.

Social learning

Social learning theory has progressed from the initial achievement of bringing the language and data of learning theory to bear on an understanding of complex human functioning to a sophisticated application of modern information-processing concept [7, p. 776]. The success of organisations depends on their ability to design themselves as social learning systems and also to participate in broader learning systems such as an industry, a region, or a consortium [21, p. 225]. Especially when trying to understand human interactions or to predict behaviours, we shouldn't look for answers only in large volumes of data. Big Data, small data and more traditional data handling approaches can become trustworthy companions [4, p. 981].

In most organisations, social learning or informal learning is carried out through e-learning. Social learning can also be realised through collaboration tools or externally on social media networks like LinkedIn, even Facebook. Social learning is expected to become the most common form of learning. It is also expected that there will be traditional forms of learning in combination with different forms of social learning. As part of social learning, many organisations have introduced new trends: the trend of self-directed learning and self-evaluation via e-learning in 2018.

Blockchain technology

Blockchain and Bitcoins are trends that will show enormous growth in the following period. The main idea of the blockchain is decentralisation, i.e., a reliable way for decentralised storage of vital information about cryptocurrency, as well as a system for performing transactions among users. Blockchain is a database whose structure consists of smaller bases (blocks) that are interconnected, since each block contains hash of the previous block. Each block contains hash code of the previous block, root hash, one-time code and timestamp. Always after one block is closed, a new one is created. Blockchain stores information about all online transactions and takes care of their proper replication. Each party or member has a peer node in the network. A large number

of members can cooperate with each other, but they do not need to have information about each other.

Now blocks are created by high-power computers, in the process named cryptocurrency mining. By mining the Bitcoin blockchain, Bitcoin (BTC) becomes a currency. Blockchain technologies provide the infrastructure for cryptocurrencies and the basis of crypto economy. Mathematical rules, a huge amount of computer processing power, and the existence of copies of the same system on multiple computers, all make Bitcoin blockchain a completely safe database.

Blockchain technology has enabled digital information to be distributed rather than copied, thereby creating a platform for a revolutionary new version of the Internet. This technology has enormous potential in many industries especially in the financial sector, as a support of efficiency and transparency in global money transactions.

Conclusion

Today's business environment is very complex and dynamic. In order for economic and social entities to succeed and operate effectively, they have to use all available resources. Intellectual capital is one of the most important (perhaps the most important) resource for economic and social organisations. In the past centuries, more significance was attributed to tangible forms of capital, but the 21st century is the age when intellectual capital is viewed as very important.

The first step in the process of creating intellectual capital is learning, i.e., education, because knowledge is one of the most important elements of this type of capital. Therefore, an entity wanting to use this resource cannot be the only creator of this capital; the entire society must participate through a well-established system of education. Learning must be performed thoroughly and quickly, faster than competitors, if we want to achieve a competitive advantage.

In order to improve business management and positioning in the market, business and social organisations take advantage of available information technologies. IT includes not only modern hardware technology but also techniques, methods, models, platforms and processes.

BI&A, ML, AI and IoT are some of the most dynamic IT fields. The application of these modern IT forms covers a wide range of processes, ranging from fraud detection, through the future outcomes prediction, to decision-making at different levels.

Increasingly, social media are replacing the traditional ones. Their influence in the contemporary social life and business is growing. In particular, perhaps the greatest influence of social media in business is reflected in marketing. However, regardless of the increasing popularity of social platforms and networks, many authors believe that live communication, i.e., direct contact with clients cannot be replaced. Therefore, expected future trends will be towards live streaming video content. Blockchain and Bitcoin technologies are quite revolutionary, and will reach its maximum in the future. All these issues should be guidelines for future market, consumer and customer research.

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