

**Milica Jovanović<sup>1</sup>***Innovation Center, University of Niš***Bojan Petrović<sup>2</sup>***Faculty of Economics, University of Niš***Ivana Janjić<sup>3</sup>***Innovation Center, University of Niš*

P. 13-22

SCIENTIFIC REVIEW PAPER

DOI: 10.5937/ESD2101013J

Received: January 5, 2021

Accepted: February 28, 2021

## KEY DETERMINANTS OF SUSTAINABLE INTELLECTUAL CAPITAL OF ENTERPRISES

### Abstract

*Sustainable intellectual capital, in the new economy, is becoming a key determinant of sustainable growth and development of enterprises. This is an important precondition for gaining a sustainable competitive advantage of a modern enterprise. It is intellectual capital that includes knowledge aimed at solving environmental issues. Also, these intangible assets of enterprises include the so-called green innovations that contribute to the sustainability of enterprise business. Moreover, successful enterprises are expected to adopt corporate social responsibility strategies, and as a result, the concepts of sustainable intellectual capital and green intellectual capital are being developed. The aim of this paper is to present the basic characteristics of the modern approach to intellectual capital in the era of knowledge economy, i.e. to point out important elements of the concept of sustainable intellectual capital and the concept of green intellectual capital.*

**Keywords:** *sustainable intellectual capital, sustainable business, green intellectual capital, corporate social responsibility*

**JEL classification:** *M21, O34, Q56*

## КЉУЧНЕ ДЕТЕРМИНАНТЕ ОДРЖИВОГ ИНТЕЛЕКТУАЛНОГ КАПИТАЛА ПРЕДУЗЕЋА

### Апстракт

*Одрживи интелектуални капитал, у новој економији, постаје кључна детерминанта одрживог раста и развоја предузећа. То је важна претпоставка стицања одрживе конкурентске предности савременог предузећа. Реч је о интелектуалном капиталу који укључује знање усмерено на решавање питања заштите животне средине. Такође, ова нематеријална имовина предузећа укључује и такозване зелене иновације које доприносе одрживо-*

<sup>1</sup> jovanovicmilicaa90@gmail.com, ORCID ID 0000-0002-6410-0938

<sup>2</sup> bocibp@yahoo.com, ORCID ID 0000-0003-2630-1154

<sup>3</sup> ivana91.ekfak@gmail.com, ORCID ID 0000-0003-3142-8467

*сти пословања предузећа. Осим тога, од успешних предузећа се очекује и да усвајају стратегије корпоративне друштвене одговорности, а као резултат, развијају се концепти одрживог интелектуалног капитала и зеленог интелектуалног капитала. Циљ рада је да прикаже основне карактеристике новог приступа интелектуалном капиталу у ери економије знања, односно да укаже на битне елементе концепта одрживог интелектуалног капитала односно концепта зеленог интелектуалног капитала.*

**Кључне речи:** одрживи интелектуални капитал, одрживо пословање, зелени интелектуални капитал, корпоративна друштвена одговорност

## Introduction

In the era of knowledge economy, the success of an enterprise increasingly depends on the intangible asset. It is based on people, their competencies and experience. Namely, it is intellectual capital of an enterprise and it includes employees, structural intellectual capital and employee relations with the enterprise stakeholders. Unlike the industrial era, in which physical and financial resources played a key role in achieving a competitive advantage, in modern business conditions, intellectual resources are the most important asset for gaining a sustainable competitive advantage, as well as sustainable growth and development (Mladenović, Arsić, 2017).

Sustainable intellectual capital is related to all the knowledge that an enterprise uses in the environmental management process (Lopez-Gamero et al., 2011). It requires the inclusion of all elements of intellectual resources in solving environmental issues. This includes environmental management and the development of innovations that can enable environmental protection. These innovations are also known as green innovations or eco-innovations.

The development and application of green innovations allow an enterprise to grow and develop sustainably and enhance business performances. In this way, the enterprise ensures long-term business activity, meeting the requirements of the community in which it operates.

Corporate social responsibility (CSR) initiatives and practices are of great importance in developing sustainable intellectual capital, which ultimately means a sustainable competitive advantage. As a result, human resources of an enterprise are motivated better, loyal and long-term relations with all stakeholders are created and valuable structural assets of the enterprise are developed - above all, adequate organizational structures and innovative organizational culture. Therefore, the CSR concept is an important segment of the concept of sustainable intellectual capital. On the other hand, the motivation for applying CSR practices depends on the quality of intellectual capital possessed by the enterprise.

## 1. Sustainable intellectual capital as a determinant of sustainable business of enterprises

There are different understandings of authors when it comes to the concept of intellectual capital of an enterprise. According to Roos and Roos (1997), intellectual capital is based on two segments: human capital and structural capital. Van Buren (1999) identifies four

components of intellectual capital: human capital, innovation capital, process capital, and customer capital. Intellectual capital as an intangible asset of an enterprise consists of three segments: human capital, structural capital (organizational and innovation/technological capital) and relational capital (social capital) (Bontis, 1999; Bernardi, Demartini, Paoloni, 2014; Krstić, 2014; Vătămănescu et al., 2019). The concept of intellectual capital includes three elements, as suggested by Sveiby (1997), but with a slightly different structure - employee competencies, internal structure and external structure.

However, despite the disagreement over the elements of intellectual capital, all authors point out that intellectual capital provides various benefits to the modern enterprise (Krstić, Bonić, 2016; Krstić, Rađenović, 2018). In addition, it is a condition for its sustainability. Intellectual capital, in an era based on knowledge, is becoming a key source of competitive advantage. Although it is an invisible and non-physical asset, it determines the future value of the company and indirectly the value creation in the company (Petković, Krstić, Rađenović, 2020). Some authors conclude that intellectual capital is an important factor of sustainable enterprise performances (Bueno et al., 2004; Mondal, Ghosh, 2012). Intellectual asset is a key determinant of gaining a sustainable competitive advantage (Steward, 1991; Petty, Guthrie, 2000; Todericiu, Stanit, 2015; Yaseen, Dajani, Hasan, 2016; Vătămănescu et al., 2019) and a key source of value creation (Hall, 1992; Edvinsson, 1997; Sveiby, 1997; Lev, 2001) in the knowledge economy. Namely, intangible resources are more difficult to copy, resulting in barriers to competition. By doing so, an enterprise can more easily maintain a long-term competitive advantage. In addition, Todericiu and Stanit (2015) highlight that intellectual resources are essential to the long-term development of an enterprise. Without these resources, the company will not be able to grow and develop in the long run (Gross-Golacka et al., 2020). Xu, Chen and Zhang (2020) emphasize that intellectual capital has a significant influence on sustainable growth of enterprises. Such claims have been made by other authors (Wiig, 1997; Subramaniam, Youndt, 2005, Xu, Wang, 2018). Some authors (Omar, Yuso, Zaman, 2017; Mukherjee, Sen, 2019; Gross-Golacka et al., 2020) state that intellectual capital contributes to business sustainability. They concluded that some elements of intellectual capital have a significant importance for enterprise sustainability – employee skills, reliability, knowledge, motivation and health, customer loyalty and satisfaction, reputation and image of an enterprise, information systems and databases, organizational culture. All this underlines the importance of intangible assets for sustainable business.

Bernardi, Demartini and Paoloni (2014) argue that the inclusion of the concept of sustainability in the concept of intellectual capital can be envisaged by segments of intellectual capital - structural capital, human capital, and relational capital. Within the structural intellectual capital, the category of sustainability is environmental capital – eco-product strategy and greenhouse gas emissions strategy. Further, in human capital, health and security and gender can be observed. Finally, the determinants of sustainability within relational capital are corporate citizenship and stakeholder engagement.

Other authors (Cavicchi, Vagnoni, 2017) suggest that the link between intellectual capital and sustainability can be seen across the following elements of intellectual capital:

- Human capital – competences;
- Structural capital – organizational culture, leadership support, collaborations among managers and employees, organizational capabilities, managerial philosophy, advanced technologies;
- Relational capital – cooperation and stakeholder support.

The development of sustainable intellectual capital, from which an enterprise derives various advantages, requires certain investments and efforts of the enterprise management. Lopez-Gamero and his co-authors (2011) describe how sustainable intellectual capital can be achieved. Creating sustainable human capital requires, first of all, publishing an environmental policy. It includes the company's commitment to address specific issues – "pollution prevention, legislative compliance and ongoing improvement" (p. 24). For greater employee involvement, these authors suggest the following: environmental training and meetings, seminars and workshops, employee participation by appreciating their innovative ideas and initiatives. The final goal is to develop employee environmental skills in that way. Sustainable structural intellectual capital includes two components: 1) sustainable organizational capital – organizational structures and organizational culture in accordance with environmental issues; and 2) sustainable technological capital – eco-products, cleaner processes and machinery in the enterprises. Claver-Cortes and co-authors (2007) indicate that sustainable relational capital includes ecological brands, ecological labels and certifications. This type of sustainable intellectual capital is based on different relationships of an enterprise with its stakeholders – customers/clients, investors, society, competitors, suppliers, strategic partners. It requires the involvement of those stakeholders and their knowledge to solve environmental problems. These authors (Claver-Cortes et al., 2007) also use the following terms for this issue - human environmental capital, structural environmental capital and relational environmental capital. They define environmental capital as "part of the "gap" existing between market value and book value" (p. 173). In addition, the concept of green intellectual capital is introduced as well (Chen, 2008).

## 2. The concept of green intellectual capital

For the business of modern enterprises, the dimension of the environment plays an important role. It means that successful enterprises are supposed to invest in environmental protection and solve environmental problems. In order to meet these goals, enterprises are investing in the development of the so-called green innovations, which are an important part of sustainable intellectual capital.

Chen (2008) analyses the impact of intellectual capital on the competitiveness of enterprises and introduces the concept of green intellectual capital. This author points out the connection between intellectual capital and environmental management, and defines the three components of green intellectual capital – green human capital (knowledge, skills, experience, creativity, commitment of people within an organization), green structural capital (management systems and philosophies, reward systems, IT systems, databases, processes, organizational culture) and green relational capital (relationships of the organization in relation to environmental management and green innovation). *Chen (2008)* proposes certain indicators for monitoring and measuring green intellectual capital by elements (Table 1). This concept of intellectual capital includes intellectual capital in the context of green innovation. Namely, the results of this study highlight that larger investments in »green human capital, green structural capital and green relational capital" strengthen the company's competitive advantage (*Chen, 2008*).

*Table 1: Indicators of green intellectual capital*

"Green human capital" Chen (2008)	<ul style="list-style-type: none"> <li>- productivity in terms of environmental protection activities</li> <li>- employee's environmental protection competences</li> <li>- green products and services</li> <li>- the degree of teamwork in terms of environmental protection activities</li> <li>- the degree of management support to employees in relation to environmental goals</li> </ul>
"Green structural capital" Chen (2008)	<ul style="list-style-type: none"> <li>- a management system for improving the quality of environmental protection activities</li> <li>- profit from environmental protection activities</li> <li>- environmental protection investments in R&amp;D/sales</li> <li>- green innovations</li> <li>- investments in environmental protection facilities</li> <li>- quality of management system for enterprise environmental knowledge</li> </ul>
"Green relational capital" Chen (2008)	<ul style="list-style-type: none"> <li>- the level of respect for desires of eco-friendly consumers</li> <li>- the level of relationships stability with suppliers in terms of environmental protection</li> <li>- the level of relationships stability with strategic partners in terms of environmental protection</li> </ul>

*Source: Chen (2008)*

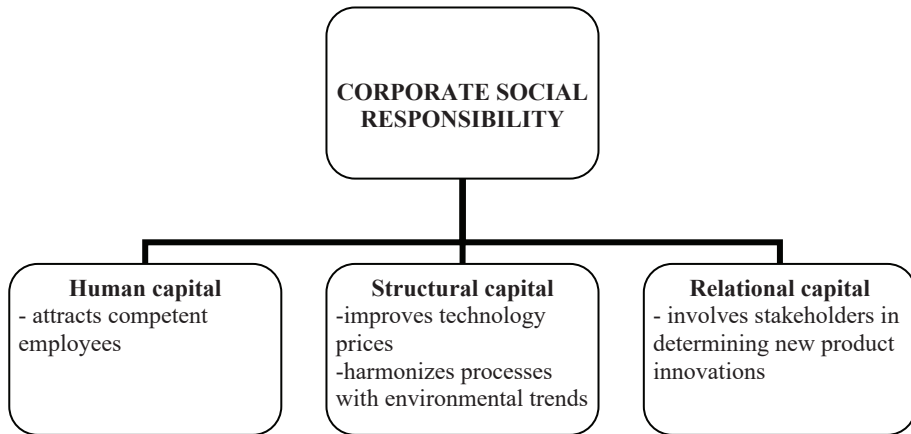
Chen and his co-authors (2006) investigated the importance of green innovations to an enterprise competitive advantage. They concluded that there was a positive impact of green innovations (waste recycling, energy-saving technology, pollution-prevention technology) on the competitive advantage of analysing enterprises. In this way, the importance of the green elements of intellectual capital for business performance and business sustainability is pointed out.

### **3. Corporate social responsibility as a factor of sustainable intellectual capital**

In new business conditions, enterprises notice the need to harmonize their business decisions and goals with the interests of the community, environmental issues and to take responsibility for the consequences of their activities. This means that the actions and policies of a company are in line with the expectations of stakeholders, while respecting economic, social and environmental dimensions (Jovanović, 2017). Corporate social responsibility becomes an important factor in resolving ethical and social issues associated with management behaviour and decision-making in an enterprise (Gangy et al., 2019). Environmental issues are the basis of the concept of corporate social responsibility (Li, Toppinen, 2011) which implies that there is a close connection between the concepts of CSR and green intellectual capital.

Figure 1 assumes that corporate social responsibility (CSR) promotes the development of sustainable intellectual capital (Chang & Chen, 2012).

Figure 1: Benefits of CSR for sustainable intellectual capital



Source: Chang & Chen (2012)

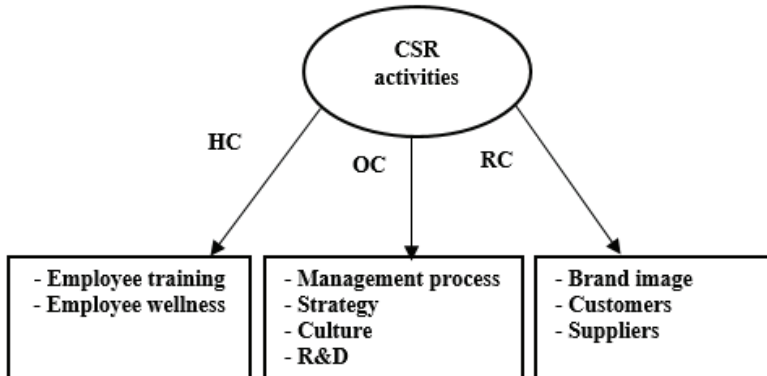
Gallardo-Vázquez, Valdez-Juárez and Lizcano-Álvarez (2019) studied the relationship between CSR and segments of enterprise intellectual capital. They came to the conclusion that CSR initiatives affected the satisfaction and commitment of human intellectual capital of enterprises. On the other hand, satisfied employees were motivated to implement CSR strategies of the enterprise. Moreover, a responsible management of the company was established. Furthermore, CSR encouraged external communications and, as a result, that led to better relations with external stakeholders. It enabled enterprises to obtain greater legitimacy. With respect to structural intellectual capital, CSR strategies can specifically enhance the organizational capital of an enterprise. The improvement of intellectual capital through the implementation of CSR initiatives contributes to the creation of sustainable intellectual capital.

Gangi and co-authors (2019) analyse the impact of CSR engagement on intellectual capital efficiency. Namely, the efficient use of intellectual capital contributes to the development of sustainable intellectual capital. They make a conclusion that the effects of CSR on intellectual capital are based on the following (Gangi et al., 2019):

- 1) CSR increases organizational and individual knowledge of enterprises;
- 2) CSR improves organizational culture by fostering an innovative culture and a culture of trust;
- 3) CSR attracts experts, talented and creative employees;
- 4) CSR strengthens trust in relations with strategic partners;
- 5) CSR improves transparency of business and internal and external communications;
- 6) CSR improves the image and reputation of the enterprises.

Pedrini (2007) found that the concept of sustainability linked CSR activities with intellectual capital of the enterprise (Figure 2). This study included the investigation of the impact of CSR activities on the sustainability of intellectual capital components (Pedrini, 2007): “human capital (HC), organizational capital (OC) and relational capital (RC)”.

Figure 2: Impact of CSR activities on the sustainability of intellectual capital



Source: Pedrini (2007)

The previous figure highlights the positive effects of CSR on intellectual capital. Namely, CSR activities affect employee motivation, skills, loyalty, safety and health, which contribute to sustainable human capital of an enterprise. Also, CSR improves communication, enterprise processes, competitive strategies, culture and environmental R&D activities. Furthermore, CSR engagement encourages brand image and reputation, attracts new loyal customers and improves cooperative relationships (with partners, competitors, suppliers).

## Conclusion

In modern conditions, enterprises are required to identify all available resources, especially intellectual, bearing in mind that these resources are invisible and that there is an increasing tendency to report on this component of the company's assets. By raising the visibility of these resources, intellectual resources contribute to sustainable business. Namely, a more efficient use of all forms of resources, and especially intangible resources, contributes to the sustainability of enterprises.

Successful enterprises accept the concept of sustainability in the development of human resources, structural and relational capital. This means that they develop their processes, IT systems, strategies, relationships with stakeholders in a way that respects the needs of the environment. By directing the enterprise knowledge towards solving environmental problems, enterprises adopt the concept of sustainable intellectual capital, which ultimately contributes to their business performance. The goal is to ensure sustainable growth and development of enterprises and businesses in the long run through the adoption of this concept.

Although sustainable intellectual capital implies certain investments in emission and pollution control systems, recycling, eco-technology and eco-processes, the development of this capital provides a long-term market advantage of an enterprise. These are investments that take less into account the short-term goals, and more the long-term orientation and the survival of enterprises.

## References

- Bernardi, C., Demartini, P., Paoloni, P. (2014). Managerial Integrated Reporting. Evidence from practice. *Management Control*, 3, 37-58.
- Bontis, N. (1999). Managing organizational knowledge by diagnosing intellectual capital. *International Journal of Technology Management*, 18(5–8), 433–462.
- Bueno, E., Paz Salmador, M., Rodríguez, Ó. (2004). The role of social capital in today's economy: Empirical evidence and proposal of a new model of intellectual capital. *Journal of Intellectual Capital*, 5, 556–574.
- Cavicchi, C., Vagnoni, E. (2017). Does intellectual capital promote the shift of healthcare organizations towards sustainable development? Evidence from Italy. *Journal of Cleaner Production*, 153, 275-286.
- Chang, C., Chen, Y. (2012). The determinants of green intellectual capital. *Management Decision*, 50(1), 74-94.
- Chen, Y.-S. (2008). The Positive Effect of Green Intellectual Capital on Competitive Advantages of Firms. *Journal of Business Ethics*, 77(3), 271–286.
- Chen, Y.S., Lai, S.B., Wen, C.T. (2006). The Influence of Green Innovation Performance on Corporate Advantage in Taiwan. *Journal of Business Ethics*, 67(4), 331–339.
- Claver-Cortés, E., López-Gamero, M.D., Molina-Azorín, J.F., Zaragoza-Sáez, P.C. (2007). Intellectual and environmental capital. *Journal of Intellectual Capital*, 8(1), 171 – 182.
- Edvinsson, L. (1997). Developing intellectual capital at Skandia. *Long Range Planning*, 30(3), 366-373.
- Gallardo-Vázquez, D., Valdez-Juárez, L.E., Lizcano-Álvarez, J.L. (2019). Corporate Social Responsibility and Intellectual Capital: Sources of Competitiveness and Legitimacy in Organizations' Management Practices. *Sustainability*, 11, 1-29.
- Gangi, F., Salerno, D., Meles, A., Daniele, L.M. (2019). Do Corporate Social Responsibility and Corporate Governance Influence Intellectual Capital Efficiency? *Sustainability*, 11, 1-25.
- Gross-Gołacka, E., Kusterka-Jefmanska, M., Jefmanski, B. (2020). Can Elements of Intellectual Capital Improve Business Sustainability?-The Perspective of Managers of SMEs in Poland. *Sustainability*, 12(4), 15-45.
- Hall, R. (1992). The strategic analysis of intangible resources. *Strategic Management Journal*, 13(2), 135-144.
- Jovanović, M. (2017). Corporate social responsibility as a determinant of sustainability. *Economics of sustainable development*, 1(1), 93-107.
- Krstić, B. (2014). *Upravljanje intelektualnim kapitalom preduzeća*. Niš: Ekonomski fakultet Univerziteta u Nišu.
- Krstić, B., Bonić, L. (2016). EIC: a new tool for intellectual capital performance measurement. *Prague economic papers*, 2016(6), 723-741.
- Krstić, B., Rađenović, T., (2018). *Strategijsko i operativno upravljanje intelektualnim kapitalom*. Niš: Ekonomski fakultet Univerziteta u Nišu.

- Lev, B. (2001). *Intangibles: Management, Measurement and Reporting*. Washington D.C.: Brookings Institution Press.
- Li, N., Toppinen, A. (2011). Corporate responsibility and sustainable competitive advantage in forest-based industry: Complementary or conflicting goals? *For: Policy Econ.*, 13, 113–123.
- Lopez-Gamero, M.D., Zaragoza-Saez, P., Claver-Cortes, E., Molina-Azorin, J.F. (2011). Sustainable development and intangibles: building sustainable intellectual capital. *Business Strategy and the Environment*, 20(1), 18-37.
- Mladenović, M., Arsić, Lj. (2017) Benefiti zelene ekonomije u funkciji povećanja konkurentne prednosti nacionalnih ekonomija, *Ekonomski pogledi*, 19(2), 81-97.
- Mondal, A., Ghosh, S.K. (2012). Intellectual capital and financial performance of Indian banks. *Journal Intellectual Capital*, 13, 515–530.
- Mukherjee, T., Sen, S.S. (2019). Intellectual Capital and Corporate Sustainable Growth: The Indian Evidence. *J. Bus. Econ. Environ. Stud.*, 9(2), 5–15.
- Omar, M.K., Yuso, Y.M., Zaman, M.D.K. (2017). The Role of Green Intellectual Capital on Business Sustainability. *World Appl. Sci. J.*, 35, 2558–2563.
- Pedrini, M. (2007). Human Capital Convergences in Intellectual Capital and Sustainability Reports. *Journal of Intellectual Capital*, 8(2), 346-366.
- Petković, M., Krstić, B., Rađenović, T. (2020). Accounting-based valuation methods of intangible assets: theoretical overview. *Ekonomika*, 66(1), 1-12.
- Petty, R., Guthrie, J. (2000). Intellectual Capital Literature Review: Measurement, Reporting and Management. *Journal of Intellectual Capital*, 1(2), 155-176.
- Roos, G., Roos, J. (1997). Measuring Your Company Intellectual Performance. *Long Range Planning*, 30(3), 413–426.
- Steward, T. (1991). Brainpower: Intellectual Capital is Becoming Corporate America's Most Valuable Asset and Can Be Its Sharpest Competitive Weapon; the Challenge is to Find What You Have – and Use It. *Fortune Magazine*, 123, 44-60.
- Subramaniam, M., Youndt, M.A. (2005). The influence of intellectual capital on the types of innovative capabilities. *The Academy of Management Journal*, 48(3), 450–463.
- Sveiby, K.E. (1997). *The New Organizational Wealth – Managing & Measuring Knowledge-Based Assets*. San Francisco: Berrett-Koehler Publishers, Inc.
- Todericiu, R., Stanit, A. (2015). Intellectual Capital – The Key for Sustainable Competitive Advantage for the SME's Sector. *Procedia Economics and Finance*, 27, 676 – 681.
- Van Buren, M.E. (1999). A Yardstick for Knowledge Management. *Training and Development*, 53(5), 71–77.
- Vătămănescu, E., Gorgos, E., Ghigiu, A.M., Pătruț, M. (2019). Bridging Intellectual Capital and SMEs Internationalization through the Lens of Sustainable Competitive Advantage: A Systematic Literature Review. *Sustainability*, 11(9), 1-22.

- Wiig, K.M. (1997). Integrating intellectual capital and knowledge management. *Long Range Planning*, 30, 399–405.
- Xu, J., Wang, B. (2018). Intellectual Capital, Financial Performance and Companies' Sustainable Growth: Evidence from the Korean Manufacturing Industry. *Sustainability*, 10, 1-15.
- Xu, X.L, Chen, H.H., Zhang, R.R. (2020). The Impact of Intellectual Capital Efficiency on Corporate Sustainable Growth-Evidence from Smart Agriculture in China. *Agriculture*, 10(6), 1-15.
- Yaseen, S.G., Dajani, D., Hasan, Y. (2016). The impact of intellectual capital on the competitive advantage: Applied study in Jordanian telecommunication companies. *Computers in Human Behavior*, 62, 168–175.