DOI 10.2478/sbe-2021-0011

SBE no. 16(1) 2021

HOW INTELLECTUAL CAPITAL IS MADE?

PORANCEA-RĂULEA Andreea Simina
Lucian Blaga University of Sibiu, Romania

Abstract:

Worldwide organizations are compelled by global competition to achieve notable, inimitable results. In order to achieve this organizations must differentiate themselves from their competitors by using intangible resources that can get the long-term competitive advantage. This can be accomplished by identifying and managing the important elements of performance more effectively and efficiently. Consequently, organizations have to be aware and understand the connection between valuing intellectual capital and their performance. This article enhances the relationship between intellectual capital indicators and the measures to be taken in order to become strong innovators at european level. By identifying the key indicators taken into consideration at European level an national analysis was made in order to identify the weak points that made a gap between Romania and the other european countries.

Key words: *intellectual capital, innovation strategies, innovative skills*

1. Introduction

The past was characterised by labour and capital intensive industries, the present is driven knowledge intensive industries and technology. Davenport and Glaser (2002) and Hansen et al. (1999) concluded that competitive organizations have as main asset the knowledge and constantly extracting value from it represent the key to continuous improvement. Grant 1996 and Spender 1996 also came to the conclusion that the developing and making use of valuable and inimitable knowledge is the most important aspect that influences business performance. Hence, the amount of all intangible assets a business can capitalize for gaining competitive advantage is linked with higher profit and better performance overall (Youndt et al. 2004).

This study contributes to the literature on intellectual capital by synthesising a part of the studies on intellectual capital indicators and different reports and outlining how intellectual capital can be enhanced through practical business measures.

Every business aim is to maximise the profit and fulfil market expectations. Organizations that can achieve competitive advantage through inimitable processes, products or services and perform better are concerned to hire excellent skilled employees, improve their image to the suppliers, shareholders and customers.

Human resources, customers and suppliers connection and organizational culture are among the most important components of intellectual capital. (Youndt et al. 2004; Striukova et al. 2008). Considering this, it is reasonable to put forward that organizations can be more competitive by enhancing their business practices on intellectual capital.

2. Intellectual capital components – literature review

As stated before, intellectual capital is renowned as the most crucial assets for the success of organizations. Agostini et al. (2017) stated that in order to attain better organizational performance, organizations must rethink their core activities because intangible assets are more useful and valuable compared to other resources. Intellectual capital represent the driver to competitive advantage in the market (Dzenopoljac et al., 2016; Inkinen, 2015; Steenkamp and Kashyap, 2010). These literature researches advocate that intangible resources definitively outweighs the tangible resources, and nowadays the ability to strive is increasingly influenced by the reliance on intangible assets.

Moreover, multiple research (Pirozzi and Ferulano, 2016; Daou et al., 2014; Jordnao and Novas, 2017; Molodchik and Jardon, 2017) concluded that intellectual capital has a positive relation with the performance and success of organizations . Despite the activity, economic sector, company size, and presence in the market intellectual capital is considered one of the most important and which makes the difference assets for the organization's profit.

But to better understand how intellectual capital influences organization performance first is necessary to understand which are their components. Intellectual capital is composed of the intangible assets that organization owns and facilitates the creation of valuable products and services.

Intellectual capital has multiple definitions and structures, this being influenced by the fact that the concept has not yet a common and homogeneous acceptance.

Numerous definitions and classifications use various terminologies but however, three main dimensions of intellectual capital have been agreed upon by most researchers, namely, human capital, social capital and structural capital. Furthermore a distinct indicator must be taken into consideration separately. Technology capital is easily converted to value by different licensing methods and this is the reason why most of the organizations intend to assimilate it.

Related to the knowledge that lies within the employees, their competences, skills, and capabilities human capital is the backbone of intellectual capital. (Shaari et al., 2010; Bontis, 1998; Edwinsoon and Malone, 1997; Isaac et al., 2010). Roos et al. (1997) and Bontis et al. (2000) outlined that employees are the ones that can plant the seeds of intellectual capital through their attitude, knowledge and intellectual agility.

Being named “the glue that holds societies together” by Paldam (2000) and defined as the value of human connections based on confidence and on personal networks by Cohen and Prusak (2001), social capital has a great influence on innovation, sharing of knowledge and productivity and without a proper exploitation of this asset profitability can

be reduced in organizations. Social capital includes relationships, attitudes and values that conduct interactions among people and contribute to economic and social development in a society.

Figure 1. Intellectual capital components

Structural capital of organizations is related to organizational databases, process instructions and procedures, strategies, routines and policies (Wu and Tsai, 2005). And has a great importance for the organization's value.

The additional component of intellectual capital is represented by technological capital. Made of technical knowledge the core components are information technology, research, development and protection rights. Those components are the ones that can be easily measured but without the soft components the value of an organization decreases.

All these components have to be properly managed in order to create value. And by value most of the organizations name innovation that can be used and transformed into products, services or process enhancements that can drive to better use of the resources, which means lower costs.

3. Intellectual capital analysys – Romania

In order to have a proper image of how intellectual capital is managed in Romania we should look at the European innovation scoreboard that stipulate a comparative analysis of innovation performance in EU countries.

This report made by European Commission states that Romania is a modest innovator, being in last place. For in depth analysis 20 indicators were analysed in order to propose several measures to redress.

For the human capital the following indicators were analysed: new doctorate graduates, population aged 25-34 with tertiary education, lifelong learning and employment in knowledge-intensive activities.

Figure 2. European innovation scoreboard

Source: https://ec.europa.eu/growth/industry/policy/innovation/scoreboards_en

Figure 3. Human Capital indicators evolution

As can be seen in the figure 3, Romania scores very low at each of the 6 indicators taken into consideration. A major problem that can have effects on long term is lifelong learning. This process is the one that ensures understanding the value of knowledge and is an indispensable tool for successful organizations. In order to become a learning organization that can adapt to everything it is necessarily first to attract skilled human resources that are interested in developing new skills and competencies.

Another important aspect lies in tertiary education. In order to score better at this indicator a higher percent of GDP must be allocated. Compared to nordic Romania has a way to lower percent of 0,8% and Danmark, Finland and Sweden each scored more than

1.5% of GDP. All these countries are innovation leaders and can be seen as models of good practice.

In order to analyze the structural capital the first indicator to look for is organizational culture. Best described by Geert Hofstede (2001) as the collective mental programming of the human mind which distinguishes one group of people from another Romania's analysis through the lens of the 6-D Model is reflected below.

Figure 4. 6-D Hofstede Model analysis for Romania

Source: <https://www.hofstede-insights.com/country-comparison/romania/>

Romania scores high on power distance which characterizes employees with having a very high acceptance order of hierarchy and being subordinates generally expecting to be told what to do and preferably to work with autocratic managers.

When it comes to individualism, Romania is considered a collectivistic society. That means that organizational relationships are recognized in moral terms, and all the decisions take account of the opinion and desire of the internal collective.

The score of 42 on masculinity means that managers strive for harmony, in general, organizations value equality and solidarity in the working environment. If there are conflicts, they are resolved by compromise and negotiation.

Romania scores 90 on uncertainty avoidance meaning that within organizations is an emotional need for rules. Employees have an inner urge to do their tasks in time, precision and punctuality are the norm, and changes may be resisted.

Long term orientation scores an intermediate number for Romanian organizations culture, meaning that there is no looking forward for what can be made in order to sustain the future.

With a very low score of 20, Romanian organization culture is one of restraint. Meaning that employees have a tendency to resist change and pessimism and social norms are the barrier to develop a better connection with themselves.

Another important indicators related to the structural capital worth analysing are: enterprises providing training to develop or upgrade ICT skills of their personnel, SMEs innovating in-house, SMEs with product or process innovations.

Figure 5. Structural capital indicators evolution

As can be seen in the figure 5, one of the indicators that Romania scores best is “innovation-friendly environment”. This contradicts the fact that results from Hofstede's analysis that frame romanians organizations as resistant to innovation.

There was no data available for information, communication and technology training until 2018 and compared to nord countries or the leard innovators countries this indicator addresses an important problem that affects the overall image of Romania.

The problem of how structural capital influences the value of an organization lies in the innovation. But it is very hard to innovate when there are no leadership instruments, when the process is not optimised and the culture of the organization does not interfere with regular training or knowledge value processes that can lead to innovation.

Analysing the social capital in romanian organization 3 indicators were taken into consideration: innovative SMEs collaborating with others, public-private co-publications, private co-funding of public R&D expenditures, ease of starting a business, international co-publications.

Social Capital represents the door to new opportunities and when this door is closed the faith of any organization equals bankruptcy. The fact that we live in an globalization era has a major contribution to how an organization succeeds. If there is no space for collaboration, the knowledge does not amplify and does not evolve. Knowledge is more powerful when is shared and when collaboration is enhanced.

As can conclude from the analysed indicators romanian organizations do not collaborate as much as other countries do. Even though the public and private sector have some co-publications this is not enough in order to create value. International co-publication, collaboration between organization and public-private research initiatives must intensify in order to someday become innovation leaders.

Figure 6. Social capital evolution

Technological capital indicator is formed by the following sub indicators: patent applications, medium and high-tech product exports, knowledge-intensive services exports, sales of new-to-market and new-to-firm product innovations.

Figure 7. Technological capital evolution

The ability of using digital technology is an essential path for new organizational forms, beyond the traditional model of creating a business. This component of intellectual capital was analysed separately because it addresses the result of all the other indicators. Technological capital is linked with the result of all the creative and collaborative processes. The evolution of innovative sales shares emphasize a decreased interest in intellectual assets. Even if export medium and high tech products have an upward trend this can not be linked to intellectual assets because most of the innovative organizations have foreign capital and intellectual property assets are the property of other countries.

Figure 8. European Patent applications evolution

There is an upward trend in patent filing in Romania, with the highest number of patents in recent years but to have a clear image the 54 of Romanian patents filed in 2021 must be compared to 3276 which is the number of Samsung application patents.

Regarding the field of technology, most of the Romania patents are in the field of mechanical engineering and medical instruments. At european level medical technology, digital communication and computer technology are the areas that received the most interest from inventors. Even if Romania's organizations share common interest with european organizations when it comes to the patent field of technology there is a gap between how the process is conducted. Research must represent a collaboration between employees that share common passions. This is the way in order to achieve a better result in the ranking. For long term evolution tertiary education must be involved in the research and innovation activities of the organizations and collaboration must be enhanced.

Table 1. Patent field of technology

	Field of technology	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Total
Electrical engineering	Electrical machinery, apparatus, energy	1	1	1	2	1	2	1	2	3	1	15
	Audio-visual technology	0	1	0	0	0	0	0	1	0	0	2
	Telecommunications	0	0	0	0	0	0	1	0	0	0	1
	Digital communication	1	0	0	1	1	1	0	1	0	2	7
	Basic communication processes	0	0	0	0	0	0	0	0	0	0	0
	Computer technology	1	3	2	0	3	0	1	3	3	5	21
	IT methods for management	0	0	1	1	1	0	0	4	0	1	8
	Semiconductors	0	0	1	0	0	0	0	0	0	0	1
Instruments	Optics	0	0	0	1	0	0	0	1	0	1	3
	Measurement	4	1	3	3	2	1	0	4	2	2	22
	Analysis of biological materials	0	0	0	0	0	0	0	1	0	0	1
	Control	0	0	1	1	0	1	2	1	0	2	8
	Medical technology	0	1	2	1	2	3	3	3	4	3	22
Chemistry	Organic fine chemistry	0	0	0	0	0	0	0	0	0	0	0
	Biotechnology	0	3	1	0	0	0	2	0	0	0	6
	Pharmaceuticals	1	0	2	2	0	1	0	2	0	2	10
	Macromolecular chemistry, polymers	0	0	0	0	0	0	0	0	0	1	1
	Food chemistry	0	2	0	1	2	0	1	1	1	2	10
	Basic materials chemistry	1	7	1	0	2	0	1	2	0	1	15
	Materials, metallurgy	2	0	5	2	0	3	0	2	0	0	14
	Surface technology, coating	0	1	1	2	1	1	0	0	0	0	6
	Micro-structural and nano-technology	1	0	0	0	0	0	0	0	0	0	1
	Chemical engineering	0	0	2	1	0	1	4	1	2	1	12
	Environmental technology	0	2	0	1	0	1	0	0	1	0	5
Mechanical engineering	Handling	0	0	1	0	2	2	0	1	1	0	7
	Machine tools	0	0	1	0	0	1	0	1	4	5	12
	Engines, pumps, turbines	0	1	1	4	1	2	1	1	3	4	18
	Textile and paper machines	2	0	2	0	0	0	0	1	2	0	7
	Other special machines	2	2	1	0	0	4	1	2	4	6	22
	Thermal processes and apparatus	1	0	2	1	2	2	0	2	0	0	10
	Mechanical elements	0	1	0	0	1	2	6	0	3	0	13
	Transport	0	2	0	0	0	0	20	4	2	4	32
Other fields	Furniture, games	0	0	0	0	0	1	0	4	2	6	13
	Other consumer goods	1	3	0	0	0	0	3	1	1	1	10
	Civil engineering	1	1	0	2	3	2	4	1	1	3	18

4. Conclusions

Intellectual capital has not such a good image in the eyes of most human resources, accounting, finance, and strategy managers. This is due to the fact that even if all stakeholders understand what it is there are multiple problems and difficulties in identifying correctly, measuring and valuing it.

The result of the countries that are great innovators confirm that each indicator has a contribution to intellectual capital performance.

Companies and in consequence countries have to remain competitive and this can be done only by promoting knowledge, technology and innovation within them. In other words, what is competitive advantage equals sustained efforts to have inimitable knowledge and results. Beyond achieving the edge of competitiveness, in order to remain a valuable organization it is not enough to own assets but to know how they interfere and how to integrate knowledge. That signifies that intangible assets are therefore increasingly considered the main source of competitive advantages and long term performance.

Worth more than 70% of the total assets that an organization has, intangible assets managed in a systematic way can increase the value and the competitive advantage of any organization that is willing to see beyond the traditional way of doing things.

In the near future, the management of intellectual capital will be the most important competence with repercussions in the wealth of the countries. Now, knowledge is more important than tangible resources and how we manage to extract value from it will differentiate the countries and economies.

Now, we can project that intellectual capital will influence the whole society and this requires more attention and learning on its conception, well prepared procedures on how it can be developed and uniformity in evaluation for a wide view of the concept.

The desideratum of integrating within the core of competitive advantage and gaining profit comes with difficulties in unbiased measure of its effects on the economy through experimental or observational data.

Concluding, romanian organizations must recruit skilled employees, work on developing a long term strategy, increase the customer base, improve the work process and implement new technology and of course, make the intellectual capital visible in order to gain long-term competitive advantage.

5. References

- Agostini, L., Nosella, A. and Filippini, R. (2017), Does intellectual capital allow improving innovation performance? A quantitative analysis in the SME context, *Journal of Intellectual Capital*, Vol. 18 No. 2, pp. 400-418.
- Bontis, N. (1998) Intellectual Capital: An Exploratory Study that Develops Measures and Models. *Journal of Intellectual Capital*, Vol. 36 (2).
- Bontis, N., Chua Chong, K. and Richardson, S. (2000) Intellectual Capital and Business Performance in Malaysian Industries. *Journal of Intellectual Capital*, Vol. 1 (1).
- Cohen, D. and Prusak, L. (2001) *In Good Company: How Social Capital Makes Organizations Work*. Boston: Harvard Business School Press, MA.
- Daou, A., Karuranga, E. and Su, Z. (2014), Towards a better understanding of intellectual capital in Mexican SMEs, *Journal of Intellectual Capital*, Vol. 15 No. 2, pp. 316-332.
- Davenport, T., & Glaser, J. (2002). Just-in-time delivery comes to knowledge management. *Harvard Business Review*, 80(7), 107-111.
- Dzenopoljac, V., Janosevic, S. and Bontis, N. (2016), "Intellectual capital and financial performance in the Serbian ICT industry", *Journal of Intellectual Capital*, Vol. 17 No. 2, pp. 373-396.
- Edvinsson, L. and Malone, M. (1997). *Intellectual Capital: Realizing Your Company's True Value by Finding Its Hidden Brain-power*. New York: Harper Collins, NY
- Grant, R. (1996). Toward a knowledge-based theory of the firm. *Strategic Management Journal*, 7, 109-122.
- Hansen, M., Nohria, N., & Tierney, T. (1999). What's your strategy for managing knowledge? *Harvard Business Review*, 77(2), 106-116.
- Hofstede G. (2001), *Culture's consequences; comparing values, behaviors, institutions and organizations across nation*, (2nd ed.) Sage, Beverly Hills.
- Inkinen, H. (2015), Review of empirical research on intellectual capital and firm performance, *Journal of Intellectual Capital*, Vol. 16 No. 3, pp. 518-565.
- Isaac, Robert G., Herremans, Irene M., and Kline, Theresa J. (2010) Intellectual Capital Management Enablers: A Structural Equation Modeling Analysis. *Journal of Business Ethics*, 93.
- Jordao, R.V.D. and Novas, J.C. (2017), Knowledge management and intellectual capital in networks of small-and medium-sized enterprises, *Journal of Intellectual Capital*, Vol. 18 No. 3, pp. 667-692.
- Molodchik, M. and Jardon, C.M. (2017), Intellectual capital as enhancer of product novelty: an empirical study of Russian manufacturing SMEs, *Journal of Intellectual Capital*, Vol. 18 No. 2, pp. 419-436.

- Paldam, M., and Svendsen, G. T. (2000) An essay on social capital: looking for the fire behind the smoke. *European Journal of Political Economy*, Vol.16.
- Pirozzi, M.G. and Ferulano, G.P. (2016), Intellectual capital and performance measurement in healthcare organizations: an integrated new model, *Journal of Intellectual Capital*, Vol. 17 No. 2, pp. 320-350.
- Roos, J., Roos, G., Dragonetti, N. and Edvinsson, L. (1997) *Intellectual Capital: Navigating in the New Business Landscape*. New York: New York University Press, NY.
- Shaari, Jamal Abdul Nassir, Khalique Muhammad and Isa Abu Hassan bin Md., (2010) Ranking of Public and Domestic Private Sector Commercial Banks in Pakistan on the Basis of the Intellectual Capital Performance. *Proceedings of International Borneo Business Conference (BBC2010)*, Vol.1.
- Spender, J. (1996). Making knowledge the basis of a dynamic theory of the firm. *Strategic Management Journal* 17, 45–62.
- Steenkamp, N. and Kashyap, V. (2010), Importance and contribution of intangible assets: SME managers' perceptions, *Journal of Intellectual Capital*, Vol. 11 No. 3, pp. 368-390.
- Striukova, L., Unerman, J., & Guthrie, J. (2008). Corporate reporting of intellectual capital: Evidence from uk companies. *The British Accounting Review*, 40(4), 297–313.
- Wu, Wann-Yin and Tsai, Hsin-Ju (2005) Impact of Social Capital and Business Operation Mode on Intellectual Capital and Knowledge Management. *Int. J. Technology Management*, Vol. 30(1/2).
- Youndt, M., Subramaniam, M., & Snell, S. (2004). Intellectual capital profiles: an examination of investments and returns. *Journal of Management Studies*, 41(2), 335–361.
- Youndt, M., Subramaniam, M., & Snell, S. (2004). Intellectual capital profiles: an examination of investments and returns. *Journal of Management Studies*, 41(2), 335–361.