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THE ASSESMENT OF INTELLECTUAL CAPITAL IN ROMANIAN UNIVERSITIES

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Abstract:

The aim of this article is to systematize the types of intellectual capital indicators that can be assessed in order to understand and further use the information for strategic development. Also, the study underlines the importance of intellectual capital in the new modern, knowledge-based economy. Different research methods are used in the article, such as scientific literature analysis, synthesis and comparison.

Key words: *intellectual capital, universities, assessment, indicators*

1. Introduction

In the knowledge-based society, the management of a company needs to focus on the company's knowledge resources and their use (The Danish Trade and Industry Development Council Memorandum, 1997). This urges organizations to develop the ability to measure its knowledge and expertise - its intellectual capital - and the development of this.

In last decades investment structure has visibly changed. Tangible assets are not the only type of investment, the intangible assets investments constantly increased. For example, in USA between 1972 and 2011 tangible assets investments decreased from 12% till 8% and intangible assets investments are increased from 8% till 15%.

These changes are visible also in Europe, in countries like Finland, Denmark, Sweden, France and Netherlands the largest part of enterprise's investments is in intangible assets investments (OECD, 2013).

During recent decades, the intellectual capital (IC) concept went to a different series of definitions which are summarized in table 1.

Table no.1: Intellectual capital concept explained

Literature review	Definitions of intellectual capital
T.A. Stewart ,1991	patents, processes, management skills, technologies, information about customers and suppliers, and old-fashioned experience
Itami, 1991	the contributions of resources that have no basis on sources of tangible elements or characteristics
Bontis, 1999	the knowledge of both individual workers and the organization
MERITUM, 2001	intellectual capital is the combination of the *human, organizational and relational resources* of an organization, which divided in three categories: human capital, structural capital and relational capital. Human capital is defined as the knowledge that employees take with them when they leave the firm.
Lonnqvist, 2004	those consisting of non-physical resources of value related to the capabilities of employees, resources of the organizations, the manner in which an organization is operated, as well as the relationship of an organization's internal bodies with the shareholders.
Roos, Pike and Fernstorm , 2005	intellectual capital is all nonmonetary and nonphysical resources, that are partly or fully controlled by organization and contribute to its value creation.
Jurczak , 2008	all connected each other knowledge resources (material or nonmaterial, tangible or intangible) that the organization disposes in creating value needed to gaining competitive advantage in long term period.

Intellectual capital, also termed 'knowledge capital', helps to explain the difference between the company's market value and book value because the intellectual capital is not included in financial accounts. This applies particularly to innovative companies where the difference is more distinct than in connection with other types of companies.

The intellectual capital's influence on enterprise performance is evident, although there aren't direct financial statements that prove that. Thus, there are a large series of studies that have tried to demonstrate the indirect relationship. For example, Chen et al. (2005) found that intellectual capital amount, R&D and advertising expenditures positive impact on return on assets.

2. Intellectual capital accounts

One of the most interesting initiatives on demonstrating the importance of intellectual capital on the organization's performance was carried on by the Danish Trade and Industry Development Council which, through a memorandum, explains the case of ten Scandinavian organization that understand the importance of intellectual capital by creating a disclosure and measurement tool called "intellectual capital account". In order to manage the development and application of knowledge, companies may use intellectual capital accounts, which can provide important information about the composition and impact of the intellectual capital to the individual organization.

The ten companies, PLS Consult, Rambøll, Skandia, Consultus, Telia, ABB, Nordjylland (SparNord), The Swedish Civil Aviation Administration (SCAA), Sparbanken Sverige, WM Data, all work actively to develop their intellectual capital accounts. They state the following reasons for this (The Danish Trade and Industry Development Council Memorandum, 1997):

- *The intellectual capital accounts can be used to support the growth of the company.*
- *Both internal and external attention can be drawn to the company's way of functioning. This brings the company's management system and its development over time into focus.*
- *The ways in which investments in intangible capital are reflected in the results of the company can be illustrated.*
- *The intended implementation of the central strategies of the company can be demonstrated. Since developing a vision is often a lengthy process, the intellectual capital accounts can help to illustrate how and at what rate the company will move towards its strategy.*
- *By publishing intellectual capital accounts, a company can prove the existence of a long-term perspective to interested parties. The intellectual capital accounts can be used to demonstrate that the long-term aspect is present in every daily action.*
- *Towards the employees, the intellectual capital accounts can be used to stress the importance of devoting attention to the development of human and technological resources over a long period of time.*
- *Disclosure of costs and assets within the area of human resources becomes possible. This is of particular importance to knowledge-intensive companies where the competence of the staff is a critical asset.*

The intellectual capital accounts of the ten companies are different (since the term is presently not an authorized accounting expression), but they share a number of common features. At the basis of their analysis they have a scheme that is considered to be a must when starting the assessment, as shown in figure 1.

Figure 1: Intellectual capital account assessment scheme

Regardless of the organizations specific or dimension, the scheme indicates that one must first find the source of the intellectual capital (where it resides), what are the processes that take place in order to use the capital (if they are enough and well-adjusted to the organization's goals) and finally asses the results (can the results be improved?, is there a disclosure policy? Does everybody understand the mechanism of intellectual capital- performance?). Once the organization has identified all of the elements of the scheme, it must continue the cycle as the internal and external context might change.

- **The importance of intellectual capital for universities**

Since the 1990 when the notion of intellectual capital started to be used, more and more public sector specialists are interested in the development of this type of capital and of its' measurement. Intellectual capital is the currency of the new millennium and its wise usage is the key of success in the knowledge era.

The connection between intellectual capital and the organizational performance is the reason why universities should be concerned about the evaluation of intellectual capital. Universities are still confronted with the assessment problem in order to increase their competitive capacity and in this regard, lately there have been developed a series of reports in order to solve this by creating a unified evaluation scheme (the European Union is actively involved in promoting this reports): MERITUM (2002) -"Guidelines for Managing and Reporting on Intangibles", European Commission (2006) - "RICARDIS, Austrian Research Centers ARC (2005) -

"Intellectual Capital Report 1999-2004", Danish Ministry of Science, Technology and Innovation (2003) - "Intellectual Capital Statements – The New Guideline", etc.

It must be stated that there is no unique methodology regarding the intellectual capital evaluation in the business environment and even fewer perspective concerning that evaluation in universities, but it is clear that the approach must be different in the public sector because in this case we deal with more non-financial objectives.

Regardless of the report that we find most suiting for a certain organization (university) firstly one must develop and adjust the indicators so that the results could also be used as a benchmarking tool. A MERITUM report from 2002 emphasizes the importance of indicators development and lists the valuable characteristics that an indicator should have, table 2.

Table 2: Characteristics of a valuable indicator

Useful	An indicator is useful if it facilitates decision making both to internal and external users.
Relevant	They are relevant when providing information that can modify or reassure the expectations of decision makers. To allow this, they should be: *significant, understandable* and *timely.*
Comparable	presented following general accepted criteria, so that users may make comparisons over time and across institutions
Reliable	Trustworthy. This requires the indicators to be: *objective, truthful* and *verifiable.*
Feasible	the information for their elaboration can be obtained from the University's information system, or the cost of modifying those systems to obtain the required information should be lower th

Source: after MERITUM 2002

The indicators are useful as a benchmarking tool, but there are some aspects that must be taken into account:

- Firstly, in order to compare two universities from an intellectual capital point of view, one needs to assess the differences in their mission statements, their strategies, their dimension and the source of their founding;
- Secondly, the comparison is relevant only if we consider the moment in time when we collect the data needed for the indicators development. Different universities might be in different stages of development, or their strategy might have been severely affected by external environment factors at some point.

We consider that the intellectual capital report must be a working base document for universities, a flexible one that permits the development of relevant indicators and elimination of irrelevant ones, according to the specific need of a certain educational entity. The more relevant the indicator, the more important for the organization and its' stakeholders; from an internal point of view, assessing the university's intellectual capital provides information about its' evolution.

- **Intellectual capital assessment in universities: a "Lucian Blaga" University of Sibiu case study**

Together with the internationalization of education and research, Romanian universities need to keep up with a more intense competition, both internally and externally. This normally should urge them to evolve from a static type of management toward a more dynamic one which implies the development of capacities that allow gaining a competitive advantage and constantly working on making it a strategic advantage (Stompam, Strickland, 2001, Dess, Lumpkin, 2006).

For the current study we chose to assess some IC indicators for the "Lucian Blaga" University of Sibiu, using data from 2010-2015 period. In the current state of the research we could not provide a comparison between the "Lucian Blaga" University of Sibiu and other Romanian universities.

The "Lucian Blaga" University of Sibiu (ULBS) is a public university in Sibiu, Romania. Named after the philosopher, poet, and playwright, Lucian Blaga, it was founded in 1990 with five schools: Letters, History and Law, Medicine, Food and Textile Processing Technology, Engineering and Sciences.

Currently there is now policy in the university regarding the necessity of intellectual capital disclosure. The indicators were selected according to the data availability due to the confidentiality aspect. As a result of this situation, the calculated indicators are adapted to the current situation and needs of the university, following the scheme proposed in the ICU Report (Sanchez, Castrillo, Elena) on specific indicators for the three intellectual capital components: human capital, structural capital and relational capital, as presented in table 3.

Table 3: IC indicators assessment for "Lucian Blaga" University of Sibiu

HUMAN CAPITAL	
efficiency	Unable to calculate due to lack of sufficient information particularly due to the fact that the original indicator imposes the need to calculate the number of PhD students reported to the number of researchers, but in the case of ULBS, all the academic staff is considered to be researchers.
openness	$I1 = \frac{number\ of\ PhD\ students\ coming\ from\ other\ universiti}{total\ number\ of\ PhD\ students\ (ULBS)}$
	$I2 = \frac{number\ of\ PhD\ students\ coming\ from\ other\ universiti}{total\ number\ of\ PhD\ students\ (ULBS)}$
ORGANIZATIONAL CAPITAL	
autonomy	Unable to calculate due to lack of sufficient information
codification of knowledge	Table 5

through publications	
codification of knowledge through intellectual capital	Table 5
Strategic decisions	The University has a five years strategic plan which is always adapted to the current needs. The clients (the students) are always in the center of the strategic process. The report is publicly disseminated.
RELATIONAL CAPITAL	
Spin offs	Unable to calculate due to lack of sufficient information
Contracts and R&D projects	Unable to calculate due to lack of sufficient information
knowledge transfer through technology transfer institutions	Unable to calculate due to lack of sufficient information
knowledge transfer through human resources	$I3 = \frac{number\ of\ PhD\ students\ with\ private\ support}{total\ PhD\ students}$
	$I4 = \frac{number\ of\ PhD\ students\ with\ public\ support}{total\ PhD\ students}$
participation into policy making	Unable to calculate due to lack of sufficient information
involvement into social and cultural heart	"Lucian Blaga" University of Sibiu is considered to be a pillar in the community which provides it with the opportunity of being a partner to almost all cultural events.
public understanding of science	The university has an active involvement in promoting and disseminating science. The most recent event organized was Researcher's Night.

The classification of the intellectual capital should help an enterprise make investment decision (Lentjushenkova, Lapina, 2014) by pointing out the areas that need to be developed. In the next part we present some of the above mentioned indicators and it must be kept in mind that this is a very general assessment suggested by the ICU Report.

Table 4 presents the evolution of the number of foreign students that joined the PhD program at ULBS (in %).

Table 4: Indicators I_1 and I_2

	2011/2012	2012/2013	2013/2014	2014/2015
phd ulbs	65	73	86	90
phd foreign	8	1	5	6
phd RO	21	19	24	42
I1	**12.3 %**	**1.4 %**	**5.8 %**	**6.7 %**
I2	**32.3%**	**26.0 %**	**27.9 %**	**46.7 %**

This two indicators are meant to show the degree of openness of the university. A higher degree is considered best for an education institution that has a internationalization strategy. In the last years ULBS has been very involved in developing and investing in internationalization as a long term strategy and the increase in the percentage of foreign PhD students is a sign that the efforts are not in vain.

Table 5 provides information regarding codification of knowledge through publications and codification of knowledge through intellectual capital. Also, ULBS has twenty scientific magazines indexed ISI, Scopus, Proquest, Copernicus etc.

Table 5 Information regarding codification of knowledge through publications and codification of knowledge through intellectual capital

year	2010	2011	2012	2013	2014
ISI quoted articles	68	39	52	106	71
articles quoted in international data bases	15.4	10.02	38.1	18.05	34
articles published in conference proceedings	100	45	90	54	43
books published at national editures	140	142	139	239	320
books published at international editures	4	8	12	8	10
patents	1	1	1	2	0

Table 5 and figure 2 show us some information about the relational capital of the university. When analyzing the data we can conclude that the above mentioned situation, that the university has no employees exclusive for working on a researcher job can be a problem for the dissemination process. We find the same situation when looking at the very low percentage of funding that the university gained directly from research (less than 5%), this being consistent with the reduced number of granted

patents (just one/year). On the bright side, ULBS has a well-established birou for intellectual property protection and its strategy on a long term emphasizes the need to encourage more and more young researchers (PhD students) to develop more parent worthy projects. Also, in the last years ULBS has never missed an opportunity to attend the INVENTIKA competition, each time receiving at least one medal.

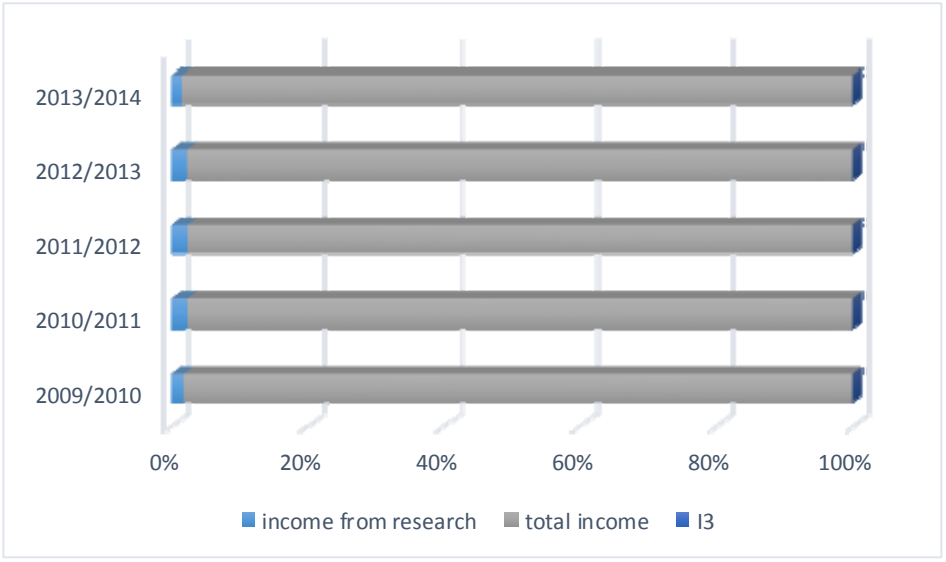

Figure 2: ULBS's income from research from total

In table 6 there are information about the PhD student and their type of funding. Firstly it must be noticed the decrease in the total number of students (normally not a very good indication) in relation with a change in the admission policy beginning with 2011. This once again demonstrates how important it is to always analyze an indicator in correlation with what happened at a certain point from a strategical perspective.

Table 6: Information regarding the number of PhD students according to the type of funding they receive (I_3, I_4)

	2009/2010	2010/2011	2011/2012	2012/2013	2013/2014
number of phd students with private support	68	70	37	37	38
number of phd students with public support	70	75	20	35	43
total number of phd	139i	147	65	73	86
I3	**48.9**	**47.6**	**56.9**	**50.7**	**44.2**
I4	**50.4**	**51.0**	**30.8**	**47.9**	**50.0**

i-The difference between the sum of the students with private and public funding and this total number of students comes from the number of foreign students that get funding through the Erasmus program.

Also, there is a good indication that almost constantly, about 50% of the PhD student funding is public. This indicates that the university is capable of attracting public funding due to its performance.

3. Conclusions

Intellectual capital is a reality and it must be managed in a long-term perspective. It takes time and skills to develop organizational competencies because they represent experiences in combining intangible and tangible assets gained over time.

The notion of intellectual capital refers to assets pivotal to the growth and development of the company, although in most cases, these assets are not weighted heavily in the formal financial accounts of the company. In this context, organizations need to develop their own way of creating a series of indicators that can show exactly how intellectual capital is a strategic tool.

In the case of the intellectual capital of universities, things are more complicated because assessing IC in the public sector poses more difficulties due to the existence of more non- financial objectives.

Although there are a series of reports that provide a scheme for the assessment, it is vital for each university to develop its own report based on indicators correlated with the organizational strategy.

"Lucian Blaga" University of Sibiu is one of the most dynamic educational institutions in Romania, but it still needs to develop in term of research and mostly on dissemination of information.

Further research: Further research should examine the indicators system for intellectual capital and the disclosure of that data in all Romanian universities and contribute to understanding the need of assessing and disclosing those information regarding this extremely interesting research area.

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4. References

Bontis, N. (2001). Assessing knowledge assets: a review of the models used to measure intellectual capital. *Intellectual journal of management reviews*, 3(1), 41- 60.

Chan, M., Cheng, S., & Hwang, Y. (2005.) An empirical investigation of the relationship between intellectual capital and firms market value and financial performance. *Journal of Intellectual Capital, 2,* 159 – 176.

Bornemann M., Wiedenhofer R., Intellectual Capital in education – a value chain perspective, available at http://ia-consulting.at/wordpress/wp-content/uploads/2012/04/Intellectual-Capital-in-Education-a-Value-Chain-Perspective.pdf

Lentjushenkova O., Lapina I., The classification of the intellectual capital investments of an enterprise, 19th International Scientific Conference; Economics and Management 2014, ICEM 2014, 23-25, April 2014, Riga, Latvia, Procedia - Social and Behavioral Sciences 156 (2014) 53 – 57

Sánchez P., Castrillo R., Elena S., The Intellectual Capital Report For Universities, PRIME – OEU Guide – The ICU Report, Available at http://www.uam.es/personal_pdi/economicas/palomas/THE%20INTELLECTUAL%20CAPITAL%20REPORT%20FOR%20UNIVERSITIES.pdf

The Danish Trade and Industry Development Council Memorandum, Intellectual Capital Accounts Reporting and managing intellectual capital, May 1997,available at http://www.oecd.org/sti/ind/1948022.pdf