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A model to evaluate the intellectual capital

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Abstract

Given the repeated observation in which intellectual capital is an increasingly important component in determining the success of the company, it should be accepted that is not yet defined a model that has the consent of the business community, and scientific management. Analysis tools must be recognized by entrepreneurs and corporate executives to become more open in providing such information and there is an understanding that the information on these values can be an important factor of credibility and success for the company. This is critical since a failure to properly conceptualize the nature and value of knowledge assets condemns firms and whole economies to fight competitive battles with outdated weapons and tactics. In this context, the purpose of this paper is to present a model to evaluate the intellectual capital considering the aspects of intellectual capital on the one hand, followed by the business community and the scientific community experiences gain in the field on the other hand.

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1. Introduction

The main problem that we have to face at in defining intellectual capital (evaluation methods and methodologies) is that the accounting - financial report system that is being used today, date back more than 500 years. The old lens cannot capture the new knowledge and innovation economy in which value is created by the intangible assets as: ideas, brands, patents, ways of working, and franchises [11]. In this context there have to be created another system that could register, analyze and evaluate intangible assets because the accounting - financial perspective is not sufficient in this case. Furthermore, this system must allow deep analysis of organization performances (under the intellectual capital perspective) in order to identify potential opportunities for increasing competitiveness.

Intellectual capital (IC) has been identified as a set of intangibles (resources, capabilities and competences) that drives organizational performance and value creation [19] [2] [3]. This suggests causal relationships between IC and organizational value creation [14]. Unfortunately, many organizations focus on primarily or exclusively on the stocks or resources because they are relatively easy to measure. According to research results in the field, managers must also, focus on measuring the transformation process or flow, which is more complicated but also, more useful: there is no correlation between how much you know and how good you are at transforming knowledge into something useful for somebody else [8] [15]. Many authors have explained the importance of IC comparing it to technological advances. In this context, IC is an intangible asset that has supplanted industrial machinery and natural resources, and it is today considered one of the most valuable factors for the creation of wealth being and at the same time source and final product. According to Ordóñez de Pablos, IC is the difference between the company's market value and its book value [17]. Another definition given by Bukowitz and Williams present IC in a dynamic way that form nonmaterial assets, which thanks to flows of knowledge can generate a potential to create goods [6].

These definitions differ one from each other but they are not disqualified each other. Most of them present IC as a knowledge capital or capital which derives from knowledge. It is recognized that IC structure consists of three domains: the human capital, the structural capital and the customers' capital (Figure 1).

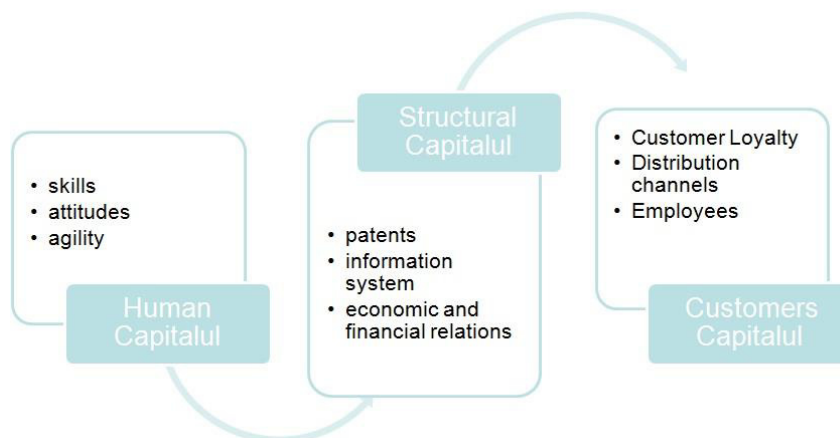


Fig. 1. Overview of the IC structure

Human capital (HC) consists of the stock of knowledge capital skills, attitude and intellectual agility of organization's employees of all categories and their capacity to make quick decisions, cope with problems and

create good interpersonal relationships. *Structural capital* (SC) depends on the productivity, organizational culture and its development capacity. SC is a type of investment in systems, tools and philosophy, which affect the knowledge flows process. SC include: equipment structure, computer networks or databases, organizational culture, management style or software. *Customer capital* (CC) refers to the connections and relationships of the organization with the external environment actors; it is the relationship with clients and other business partners.

The content of this paper is organized in five sections: section two brings an overview of IC measuring methods; section 3 presents an analysis of the most important models for IC evaluation; section 4 proposes an innovative model for the IC evaluation for attending competitive advantage; section 5 presents a case study based on the proposed IC evaluation model. Finally, section 6 presents the research conclusions.

2. IC measuring methods

During the last decades, the interest on managing the IC has led the development of various methods of measuring it. Some of these methods were attempts made by different companies for their internal use rather than the development of a universal measuring method. There are different approaches to the classification of measuring methods. Based on the works of Luthy and Williams, Sveiby categorized the existing approaches in four classes [13]: (1) Direct IC Methods (DIC) that estimate the value of intangible assets by identifying its components; (2) Market Capitalization Methods (MCM) that calculate the difference between a company's market capitalization and its stockholders' equity in order to determine the value of its IC or intangible assets; (3) Return on Assets Methods (ROA) - the result is a company ROA that is then compared with its industry average; (4) Scorecard Methods (SC) that identify the various components of intangible IC, indicators and indices that are generated and reported in scorecards or as graphs. Given the recent proliferation of the measuring methods, it is appropriate to provide an overview of them (Table 1):

Table 1 Brief overview of the IC measuring methods

Method	Type	Strengths	Weaknesses
DIC	Monetary	Allows separate measuring of the components of IC Provides a comprehensive picture of an organization's intellectual wealth Measurements are based on events	This method is specific to a particular category of organizations, and the comparison is difficult Not appropriate for benchmarking or comparisons Limited number of components
MCM	Monetary	Allow comparison of organizations in a particular field Provides a monetary value of intellectual capital Appropriate for benchmarking and comparisons.	Is not suitable for an overview of the development A purely economic focus limits the perspective
ROA	Monetary	Appropriate for benchmarking and comparisons The method is suitable to compare different organizations in the same sector Is based on traditional accounting rules	It is characterized by lack of information constituting IC A purely economic focus limits the perspective
SC	Non-Monetary	Provides a comprehensive examination of IC and performance than methods based on monetary measurement.	Sensitive to the changes of the context The amount of resulting information may be hard to analyze; it is difficult to obtain a numeric result

All approaches for the IC measuring are contextually dependent and it proves to be very hard to draw distinct boundaries between different measurable items without overlap [9], [12], [16]. Whatever method is chosen, it is important for the company to be steady in using the adequate solution. To develop dynamic IC analysis and to compare results from year to year, the method should not be changed frequently.

3. Models for the IC evaluation

The interest in evaluating IC occurred since the second half of the 20th century, when scientists have realized that the resources and the amount of resources available for the organizations business processes are scares and sometime they are not decisive for their results. Many theories and models for the IC evaluating reflect their rising importance and difficulty on finding a suitable model (in term of a suitable combination of indicators that could be used). Edvinsson has developed the first model of IC assessment called Skandia Navigator [7]. Identifying and measuring the IC is and will increasingly be the key differentiator between successful and mediocre companies. In the context of the methods of measuring IC (Table 1) several models have been developed in order to achieve further measurements. Table 2 presents the analysis of the existing models for the IC evaluation. For each method several criteria of analysis have been used as: the model type, the corresponding used method, the formula IC calculation, advantages and disadvantages. Currently, there are various measurement models of IC that seeks to consolidate financial aspects of issues relating to intangible value. Most of these models consider IC as something that is not visible, but includes value the skills, organizational processes and relationships with customers [18]. The most popular evaluation models as well as the most widely used or just the easiness of their applications of all nonfinancial measurement methods are: Technology Broker, DEC, Tobin's Q Ration, Market to Book value, EVA, MVA, Balanced Scorecard, Skandia Navigator. The measurement models for the IC are presented in Table 2, considering the criteria listed previous.

Table 2. Analysis of the models for the IC evaluation

Model	Method	Formula IC calculation	Advantages	Disadvantages
Technology Broker [4]	DIC	IC = HC + Infrastructure assets + Intellectual property assets + Market assets	The model evaluates IC of the company Importance of the intellectual property	Subjectivity in transforming quantitative results into qualitative Does not take into account synergies
DEC [5]	DIC	IC = HC+ Organizational capital + Technological capital + CC	Professional and personal growth of the company's members Creates an intelligent organization that manages cash flows of the company	Different criteria are used by different auditors May be tempted to allow itself follow the inertia of the company
Tobin's Q Ration [22]	MCM	$q = (\text{market value}) / (\text{assets replacement value})$	Offers a global view Useful for comparing companies	Hard to obtain the necessary information Depends on the market
Market to Book value [13]	MCM	$q = (\text{market value}) / (\text{assets replacement value})$	Relatively stable May be used even if the results are negative	Does not provide the exact value of the IC Sensitive to accounting standards
EVA [20]	ROA	$EVA = (ROI - WACC) \times \text{Invested Capital}$	Enables one to analyze individual business units Easy to use and appropriate for making comparisons	Does not consider future performance Business profitability has to be higher than the financing costs
MVA [21]	ROA	MVA = Market value – invested capital	Allows to determine IC Incorporates expectations of	Cannot be applied at the level of business units

			the sector	Is not valid for companies not listed on the stock exchange
Balanced Scorecard (BSC) [10]	SC	IC = Perspective of the client + Internal perspective + Perspective of the employee + Financial perspective	Attention to the needs of the stakeholders Can be applied to companies and organizational areas	Weak financial analysis Rigid model
Skandia Navigator [7]	SC	IC = HC + SC	Incorporates financial elements A broader view of the company	Experienced personnel are needed for the application Does not analyse synergies between the areas

References have proof that the number of models for IC evaluating exists; this show the importance of the topics for modern organizations but also, the difficulty on finding a metric for something so intangible. The new rules of the knowledge economy require new solutions. Traditional approaches in accounting - finance management cannot provide the most efficient and effective organization solutions, prompting them to turn them out IC evaluation models to know the actual organization [1].

4. A proposed innovative model for the IC evaluation

The proposed model has the following characteristics (Figure 2):

- Integrates IC in economic and financial reporting. Integration is necessary for organizations because intangible assets are critical to business success in an increasingly dynamics of the environment;
- Structuring IC. This will not only develop a dynamic approach but also, involves a continuous improvement process to convert IC into financial gains;
- Evaluating perspectives. The model has a number of three perspectives for each component. These perspectives are significant factors that differentiate the organization from the competition;
- Identification of relevant indicators. Selected indicators are easily interpreted and meaningful able to investigate and monitor a specific element and provides information of interest, both in terms of strategy and management, providing a simplified framework for analysis of all components of IC without favoring one section to another;
- The possibility of comparing. This model allows comparisons between different business realities, focusing on monitoring the dynamics of IC.

The aim of evaluating IC is to identify and use the intangible assets in order to gain competitive advantage. This model proposes three perspectives to evaluate IC according to its structure (HC, SC, CC). For each domain there have been defined a set of indicators used for the qualitative and quantitative evaluation (Table 3).

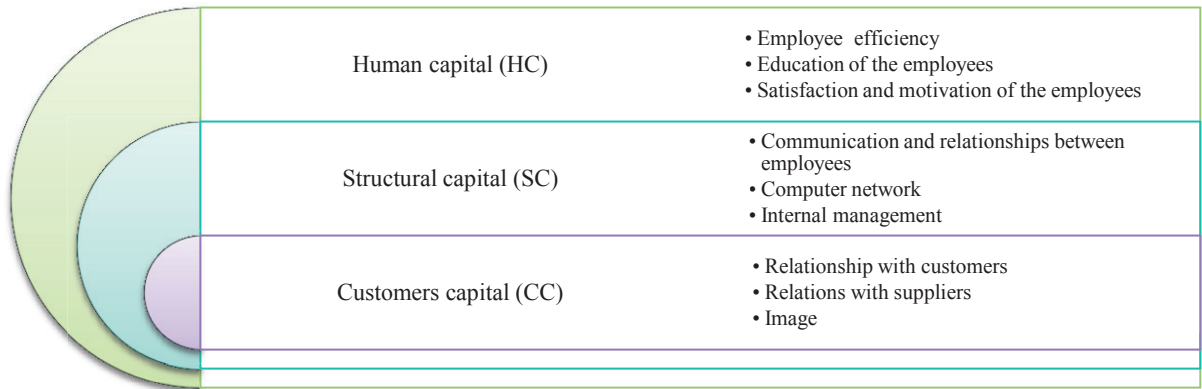


Fig. 2 A proposed model for evaluating IC

Table 3. IC indicators (partial description)

Indicators	Valuable Item 1	Valuable Item 2
Labor productivity	Turnover	Total number of employees
Usability of the maximum time available	Actual time worked	The time available annual
Share of employees with higher education	Number of employees with higher education	Total number of employees
Share of employees with secondary education	Number of employees with secondary education	Total number of employees
Share of employees performing overtime	Number of employees who work overtime	Total number of employees
Fluctuation of personnel	Number of inputs of personnel	Number of outputs of personnel
Frequency of team-buildings	The number of team-buildings	Duration (days)
Frequency of interdepartmental meetings	Number interdepartmental meetings	Duration (days)
Share of IT specialists	The number of IT specialists	Total number of employees
Frequency of computer problems	Number of recorded information IT system problems	Duration (days)
Share of employees receiving training	Total number of employees who have received training	Total number of employees
Share of employees with leadership positions	Number of employees with leading positions	Total number of employees
Share of new customers	The number of customers drawn in the last year	Total number of clients
Market Share	Company's sales value	Entire market sales value
Share suppliers lost	Number of suppliers lost in last year	Total number of suppliers
Rotation time related notes payable	Total number of suppliers	Turnover
Frequent occurrence in newspapers	The number of newspaper clippings	Duration (days)
Frequent TV appearances	The number of TV appearances	Duration (days)

The relevance of the proposed IC evaluation model lies in its ability to offer periodically, to the company management, information feedback, that enable corrective actions for the IC improvement and also, for their IC management strategy redesign for a long-term and sustainable competitive advantages through retrieving and utilizing organizational knowledge. Under the competitive circumstances knowledge becomes a vital capital; a

company must strive for a dominant position for surviving and develop itself in an increase market competition.

5. Case study – the proposed model test and validation

To demonstrate the feasibility of the proposed model of the IC evaluation there have been developed a case study in the organizational context of an IT company so call X Company. This organization is acting as an IT multinational one and it was founded in 2006 in Romania. Its turnover is of 149,517.00 EUR and it has 160 employees (data available in the end of 2011).

In order to practically exploit the proposed model for the IC evaluation there have been created a tool based on Excel software (the premise of the IC evaluation platform design as an web application). For each domain of the IC there have been defined a calculation sheet in order to capitalize quantitative and qualitative results about HC, RC and CC. The results of each IC domain evaluation were then summarized in a new sheet where it has been define the total score of the IC evaluation and the IC footprint (graphical representation). This has been done using hyperlink facilities of Excel software. An evaluation scale has been defined in order to characterize if an associated evaluation indicator for the IC is in the initiation, development or maturity level.

Some IC evaluation results have to be comment in the case of X Company.

Figure 3 shows the result of the IC evaluation by all categories: HC, RC and CC. There is a relationship between the value of HC and productivity at work, visible in the parallelism of the indicators. Thus, we can deduce that HC is being used at an optimal level, meaning also, that the level of remuneration is appropriate to labour productivity.

In regards of employees education there have been observed a large share of higher education followed by secondary education. Personnel fluctuation coefficient is insignificant due to the low number of personnel inputs and the personnel outputs (approximately constant). If these indicators are associated with the usability of the maximum working time available it seems that the company human resources was well productive and organized.

The company encourages teamwork members that will be changing depending on the different ongoing projects (number and dimension). The company uses new technologies to capture, store and use information through an organized network and an enterprise information system. Learning by doing is applying for formal and informal group learning. The company offers management training and experience exchange programs for its employees.

In the organization there is a clear distinction between manager and leader. Each company department has managers that could be as well as leaders or not (informal leaders exist also), but managers leadership behaviour is constantly develop.

In relationship with its customers, the company permanently focus on total quality management approach implementation; customer complaints are documented and they are an important part of the Customer Relationship management system; complains are analyzed and solved in short time. Company pays its debts to suppliers in 17 days, which indicates that no financial difficulties appear in the case of debt payments.

Overall there has been identify that there is a high level of implementation of the IC concept in X Company and the increasing of the IC total score of evaluation could be done by increasing human resources satisfaction through an adequate motivation strategy.

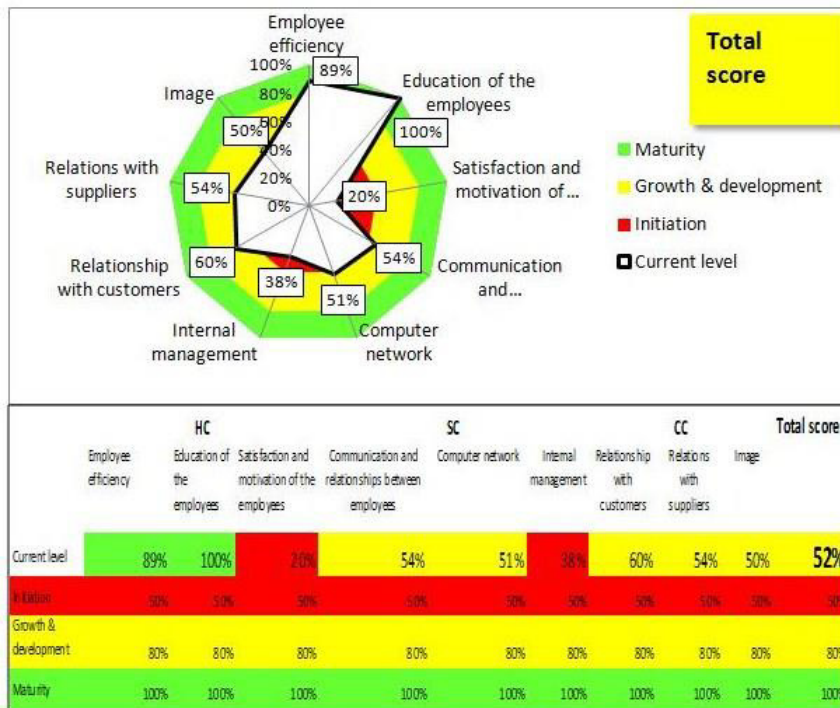


Fig. 3 IC evaluation results for X Company (the IC footprint)

6. Conclusions

With a theoretical analysis, in this article, an innovative model for the IC evaluation has been proposed. In order to define this model IC was considered structured into three domains: HC, SC, and CC, and the qualitative and quantitative measuring indicators were define according to their respective content of evaluation. This IC evaluation model enables organizations to pay more attention to the definition and understanding of the IC components, and to evaluate its developing tendency periodically in terms of IC. At the organizational level, the proposed IC evaluation model can first help them recognize the status quo of their IC, so as to discover their distance from their competitors, the demands of customers, and the enterprises with the best IC management (collect the best practices of the IC management). Second, the proposed model enables companies to understand the functions (impact and relation with the financial-accounting results) of various IC, to find out and strive for the main IC components within and outside of the company. Finally, with this measurement system an organization have to apply knowledge management practices to each department in order to assess their employees’ achievements by setting the aims in enhancing the IC for each department and each employee.

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