

ANALYSIS OF THE MODELS FOR MEASURING INTELLECTUAL CAPITAL

Maria Luminita GOGAN

¹Politehnica University, Timisoara, gogan_maria@yahoo.com

Abstract—The interest on measuring the intellectual capital (IC) has caused the development of different models of measuring it. Intellectual capital is recognized as a strategic asset and a major dominant competitive advantage for organizations. Despite an overwhelming body of literature on models for measuring the IC and increasing awareness of the need for such an assessment. Choosing a suitable model is problematic. This paper reviews the literature pertaining to the measuring of IC. Since intellectual capital is at the crux of sustainable competitive advantage, the researches field of intangibles assets is an exciting area for researchers and practitioners. A variety of models have surfaced in an attempt to measure intellectual capital and this paper aims to highlight their strengths and weaknesses. It is concluded that the perceived complexity of the decisions involved in choosing IC measurement model supports the notion that supporting systems are required to assist human decision makers.

Keywords—Intellectual capital, measurement, model, analysis

I. INTRODUCTION

THE problem of measuring intellectual capital is fundamental and very important in order to compare different organizations, to estimate their real value or even to control their improvement year by year. Also to improve the way in which organizations manage its intellectual resources that produce value and make some benefits in consequences maximizing advantages for the organization.

But to measure intellectual capital is necessary to specify exactly what the measurement models are, which the best are and which are appropriate for the organization to choose for measure its assets in proper way [1].

Properly using intellectual capital measurement models can cause the creation of competitive advantage and in consequence create development of the whole organization at the present day.

There are a number of reasons why organizations measure their intellectual capital such as: to help organizations formulate their strategy, assess strategy execution, assist in diversification and expansion decisions, and use these as a basis for compensation; and finally to communicate measures to external stakeholders.

The models of measuring of intellectual capital are in fact a simplification of reality and an approximation of the exact value. However, these models enable to identify a trend, which demonstrate whether the organization is results are better or worse than in the previous analysis. In this sense the system of measuring intellectual capital may be compared to the scales: it may never capture the exact value, but it is important to know whether the value identified is higher or lower than before [2].

There is currently various measurement models intellectual capital that seeks to consolidate financial aspects of issues relating to intangible value. Most of these models consider intellectual capital as something that is not visible, but includes value the skills, organizational processes and relationships with customers [3].

The purpose of this paper is to analyze and compare the most commonly known IC models as a first step towards meeting that challenge of creating value.

II. THE CONCEPT OF INTELLECTUAL CAPITAL

Today the intellectual capital is a key factor in company's profitability. Intellectual capital (IC) consists of the stock and flow knowledge available to an organization. These can be regarded as intangible resources which together with tangible resources comprise the market value of a business. There is no generally accepted definition of intellectual capital. However, many have offered views that provide a general concept. One of the most succinct definitions of intellectual capital is given by Stewart as "packaged useful knowledge" [4]. He explains that this includes an organization's processes, technologies, patents, employees' skills, and information about customers, suppliers, and stakeholders. Various other definitions use concepts such as ability, skill, expertise, and other forms of knowledge that are useful in organizations.

But not all experts in the field have subscribed Stewart's approach. Of these Srinivasan and collaborators believe in the intellectual capital of an organization must be included basic knowledge of the organization (including systems and processes within) and knowledge of individual employees [5]. So the Indian

consultant equate intellectual capital and knowledge capital.

A comprehensive definition of intellectual capital is offered by Brooking "Intellectual capital is the term given to the combined intangible assets which enable the company to function [6].

Some authors consider intellectual capital as an individual construction of knowledge about and skills that individuals have. For example, Ulrich argues that intellectual capital is in qualified employees who are committed to the mission of the organization [7].

Other authors see the good that functioning collectively and looked like a Meta capability. Rastogi consider holistic intellectual capital as the ability of a company to meet the challenges and harness the opportunities in continuing to try and search to create value [8].

Complex form of the intellectual capital has enabled the creation of many and various definitions and visions. Leif Edvinsson approached the tree metaphor to describe the hidden value. It says that the value is a whole hidden root of a tree. The quality of the fruit that we see is based on roots that we can not see [9]. Quality is the root that supports an organization's performance on long term.

Intellectual capital represents the resources that produce imagination, inventiveness, and competitiveness, through the generation and dissemination of thoughts, ideas and fresh approaches [10]. It is the sum and synergy of knowledge, experience, relationships, processes, discoveries, innovations, market presence, and community influence.

In a general view, intellectual capital includes intangible resources available to the organization and that gives a competitive advantage, which in combination with other potential benefits may result in future benefits [11]. This definition defines the importance of identifying the components of intellectual capital in order to measure and manage intellectual capital competent.

Important underlying concepts in these definitions include the notion that intellectual capital is something that is knowledge based, captured in an identifiable form, and useful in organizations. These definitions and underlying concepts provide a useful foundation for understanding intellectual capital.

Although there is a lot of controversy about the coverage and unanimous acceptance of a definition of intellectual capital synthesizing the above definitions it can say:

- 1) *Intellectual capital is intangible, is something hidden, intangible, difficult to understand. He gives an object of assets in order to be recognized and understood;*
- 2) *The intellectual capital structured the organization resources. There is a big difference between recognizes the importance of intangibles and power to give them substance. Intellectual capital is essentially the force that gives power to put first knowledge in wealth creation*
- 3) *Intellectual capital makes the difference in terms of companies with vision related to the knowledge economy it is the main source of intangible value and creates competitive advantage. It is based on the exploitation of other intangibles;*
- 4) *Intellectual capital is related to human resources but also the non-human. It is a holistic view of the company. It is not only related to human resources, but also non-human such as organizational processes, structures, systems, etc. It does not just stop at the mental capacity of human resources; and*
- 5) *Intellectual capital is linked to improved performance. Intangibles are the most significant resources today. However the management of most organizations continues to focus on tangible resources and their financial performance. The main purpose of intellectual capital is creating a concentration direction to improve the performance of intangible assets.*

In my opinion IC is the way of organizations value creation through its monetary, nonmonetary, physical and nonphysical resources that have to be identified (know), use (exploit), measure (evaluate, control) and manage properly. I also think that nowadays in contemporary organizations which have a global market due to fierce competition and excessive consumption trend increasingly present in many developed countries and less developed intellectual capital is a resource that can become extraordinary competitive advantage and the key to a sustainable organization, so be exploited.

The presented definitions and the associated concepts provide a useful framework for understanding the role of IC. Furthermore, in the last decade IC management became an important factor for generating competitive advantage through the increasing concern about organizational performance (mainly determine by the actual scarcity problem of resources). That is why many scientists discuss about the new approaches of organizational success, from the perspective of IC management.

III. RESEARCH APPROACH FOR THE INTELLECTUAL CAPITAL MODELS ANALYSIS

Each of intellectual capital measurement models has strengths and weaknesses. Some are very easy to apply, but the relevance of the information for running a company can be quite low. On the other hand, other models offer a more comprehensive picture of the concept of intellectual capital, but some companies may have difficulties in their implementation. In the context of the proposed approach, the different IC models will be categorized according to their structure, formula,

strengths and weaknesses (TABLE I).

Structure - Given that the concept of intellectual capital is operational in a few organizations is difficult to define components and its rigid structure. However, theoreticians and practitioners have come to brains over time some ways of structuring the intellectual capital.

Formula - is the qualitative and quantitative expression of the intellectual capital.

Strengths - to see which intellectual capital measurement model folds best in an organization must be made an analysis of strengths.

Weaknesses - because intellectual capital measurement models were made by various researchers in different

areas, these shows and weaknesses, they do not have a global vision.

The most popular measurement models as well as the most widely used or just the easiness of their applications of all nonfinancial measurement methods are: Technology Broker, Value Explorer, and Market to Book value, Balanced Scorecard, and Skandia Navigator.

TABLE I
 MODEL CLASSIFICATION SUMMARY

	Structure	Formula	Strengths	Weaknesses
<i>Technology Broker</i>	- human capital - infrastructure assets - intellectual property assets - market assets	IC = Human capital + Infrastructure assets + Intellectual property assets + Market assets	- the method evaluates intellectual capital of the company - importance of the intellectual property - related to the objectives of the company - integrated method	- subjectivity in transforming quantitative results into qualitative - does not take into account synergies - does not have a time horizon - subjective classification of IC
<i>The Value Explorer</i>	- human capital - structural capital - client capital	IC = Human capital + Structural capital + Client capital	- monetary valuation of IC - projection of results into the future - works well for companies whose activity is based on patents	- takes into account only essential competences - does not take into account synergies of the assets - quantitative value is not reliable
<i>Market to Book value</i>	- market value - invested capital	IC = Market value – invested capital	- allows to determine expectations of the results delivered by the strategies that may be adopted - incorporates expectations of the sector	- it is not an integrated method - does not take into account the opportunity cost of the invested capital - is not valid for companies not listed on the stock exchange
<i>Balanced Scorecard</i>	- perspective of the client - internal perspective - perspective of the employee - financial perspective	IC = Perspective of the client + Internal perspective + Perspective of the employee + Financial perspective	- analysis of horizontal strategic measures - evaluates the contribution of every link in the value chain and its overall performance - easy to understand, no prior experience needed	- weak financial analysis - indicators have to be chosen carefully - subjective indicators - rigid model
<i>Skandia Navigator</i>	- human capital - structural capital - customer capital	IC = Human Capital + Structural Capital + Customer Capital	- incorporates financial elements - improved predictive ability - a broader view of the company - can be adapted to any company	- experienced personnel are needed for the application - it is difficult to apply the same methodology - does not analyse synergies between the areas

applied are: a company's IC is different between its market value and net book value, which is model-net market value accounting. Customer focus of this model, processes and financial elements is similar to the model presented in Balanced Scorecard perspectives [12]

This model is based on three principles on intellectual capital:

IV. CASE STUDY – THE IC MEASURING IN COMPANY

A. Theoretical Framework

The Skandia is the result of a program started in 1991 and led by director of intellectual capital Leif Edvinsson. The purpose model is to highlight the need for future navigation organization by stimulating the renewal and development of the group. Hypothesis that this model is

- 1) Information on intellectual capital is not subordinated to the additional financial capital on
- 2) - Has a non-financial nature and is hidden gap between the market value and the value recorded in the accounting; and
- 3) - Should be treated as a problem of debts and not as assets.

B. Measuring Intellectual Capital in X Company – Case Study

Company X operates at multinational professional services. The property of the firm is based on partnership, being founded in 1991. Organization has a turnover of around 42 millions euros and a total of 500 employees.

Human Capital

The company spends considerable resources on training for its employees thus encouraging innovation and constant improvement. Being creative and innovative is a requirement within the organization, and innovation is incremental. Retaining talent is one of the main concerns of the company management policy is a mix of incentives and opportunities for career advancement. Teams are focused on internal and external clients. Team members change depending on the specific individual projects, teams are considered to be innovative, sequential improvement being the most common. The company has different social policies on employee welfare.

Structural Capital

All works and processes developed within the organization are performed by means of electrons. New technologies are used to improve the environment in which employee works. Technologies are used by facilitating teleconference and are also used to communicate with clients and representatives from other offices. Voice over IP technology is used in order to optimize communication costs. All files used in a certain activity are stored in an intranet that is used to track the progress of all projects. All authorized partners can access information at any time.

Customer Capital

The company already has a strong international presence; the company's expansion within new markets is usually on their own. In this organizational innovation is the result of interaction between stakeholder's needs, culture, performance and ideas within the company employees. Creative and innovative approaches need to be developed constantly to solve customer problems, which is how the company offers quality services for its customers. The company makes regular benchmarking analysis in the aspect of performance level competitors.

V. CONCLUSION

Despite the importance given to these methods of measuring intellectual capital, even if it offers a high degree of transparency of the organization and

operations of intellectual wealth, they may not provide a complete picture of the following reasons:

- 1) What changes are to be measured assets are intangible in nature which also makes it hard to measure;
- 2) Not reside in a single individual, but relations between individuals;
- 3) There is separable temporal location;
- 4) Little surprise measurable aspects of the production process; and
- 5) The connection between these forms of capital and economic growth is weak, almost nonexistent.

Important is that intellectual capital is no longer seen as a stock, a durable good but a sustainable process. The indication is that every organization should begin to measure the components of intellectual capital because they are a source of competitive advantage. Having control over these intangible assets allows control internal security on the one hand and effective external communication.

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