

Aspects of the Intellectual Capital of the Company in the Information Technology Era

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Abstract. In nowadays economy the dynamic of the company relies on knowledge and the way it is put to work both by the management and operational personnel. Technological advances, mostly the information technology brings a new environment that foster the intellectual assets of the company. The understanding of the subject, its importance, and the ways the intellectual capital is sustained by technological and informational means are definitely matters that allow the company to succeed or to make it lose in the global competition.

Keywords: intellectual capital, information and communication technologies, process management, measuring indicators.

1 Introduction

Although the literature separately meets the terms Intellectual Capital and Intangible Assets, they refer both to all the knowledge, skills and competencies acquired by a company, whose operation generates profits. Subtle meaning of Intellectual Capital comes also from the various means that information and technological progress offer, and added to peoples' intellectual "goods" and involvement, get the right to the company to hope in growth and competitiveness for the future.

The paper intention is to highlight the way the Intellectual Capital is meant to foster the evolution of a company through technological means given by Information Technology, beside peoples' intellectual "assets". Thus, some thoughts come to sketch how technological means could sustain and stimulate the intellectual capital – if their power is well understood by the management units and adequate measures taken in the company.

Intellectual capital is not only knowledge – as brainpower, but it something more: structures and instruments that help the knowledge to convert knowledge into new asset and new ideas which will lead the company to gain any kind of advantage over other companies in the market. Knowledge is only the „raw material” that will be used to create Intellectual Capital but obtaining it requires some „processing”. So, managers need *instruments* and specific *technology* related to knowledge in order to gain real competitiveness based on Intellectual Capital.

The *instruments* linked to knowledge come mostly from Information and Communication Technologies (ICT). However, *technology* for Intellectual Capital “processing” is something seen

in a broader sense – it is not only know-how but involve some art-like component which is *creativity*. Modern company should succeed only if ICT will sustain and combine with the creativity of people in company – from the management level to operational level.

2 Place of Intellectual Capital in the company’s market value determinants

In his paper, Robert Reich (Reich 1991), suggests a transformation in the economy into a creative one, in which the people (employees, managers, etc.) but not the goods are main factors in determining the development of a company. Thus, as a case study on the U.S. economy states, the number of creative employees was growing from 0.7% in 1900 to 5.7% in 1999 of total employment. Changing employment structure is the result of intensifying competition among companies, directing them ever more towards innovation. Accordingly, management of the companies has directed efforts for the creation and development of intangible assets to support the process of innovation through: completion of research and development costs, allocation of resources for training employees, etc.. As a result, the market value of the enterprise is becoming more influenced by intangible assets that it holds (see Figure. 1.)

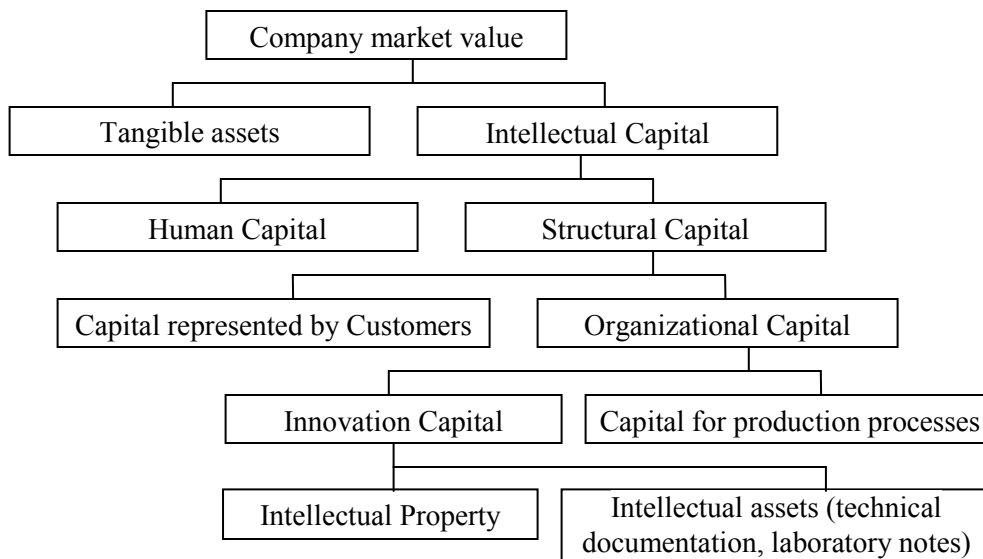


Figure. 1. Breakdown of the market value of the company on determinants. Source (Edvinsson 1997)

From Figure 1. results the enterprise value as the fair value of tangible and the intangible, the latter being part of the company's intellectual capital. Element of Intellectual Capital, the human capital is the sum of knowledge, skills and qualities of an enterprise employees and culture, set of values and principles developed in the company. Regarding capital structure, it includes all databases, software, organizational structures, trademarks, patents and other factors, company assets supporting employee productivity. Thus, structural capital consists of capital represented

by the customer and organizational capital of the company, the latter being composed of innovation capital (intellectual property rights, other intellectual assets) and capital of the company which it has invested in its production processes. Figure 1. shows the value of these forms of capital, and it proves difficult to be estimated; in this regard, many indicators further develop in order to measure the value of that form of capital.

Thus, (Sveiby 2001) proposes creation of a monitoring system for intangible assets held by a company, consisting of a table grouping a number of indicators with which to carry out value of intangible assets. These indicators vary depending on the strategy adopted by the enterprise, and they reflect how it is generated the value for shareholders: growth of intangible assets, their renewal rate, their use efficiency and stability of their operation (see Table. 1.)

| | Internal structure indicators | External structure indicators | Competence indicators |
|--|---|---|--|
| Growth Indicators | Development of external structure | Investment in IT Investment in internal structure | Competence index Number of years in profession Level of education (1) Rotation of skills |
| Indicators for the renewal / innovation | Company's image is improved by means of customer relations (2) Sales to new customers | Structure improved for relations with customers (3) Proposing new products / services New production processes implemented | Competencies won in customer relations (4) Costs of training and education Diversity of skills |
| Indicators of efficiency of use | Profit per customer Sales per customer Index of gain / loss per share customer | Weight of administrative staff | Weight of professional persons (5) Value added per employee Profit per employee <u>Profit per professional person</u> |
| Indicators of risk / stability | Index of customer satisfaction (6) Weight of corporate-client Age structure of contracts held by the company Rates of loyal customers Frequency of <u>renewed</u> contracts (8) | Index value / attitude within the organization Age of the organization Administrative Staff turnover (9) Rookie rate (10) <u>Seniority</u> (11) | Rotation of professionals (7) Average wage per employee Average wage per seniority |

Source: (Toma, 2008)

- (1) Level of education = quantified by a score given according to the studies covered by company employees;
- (2) Company's image improved by means of relations with customers = weight of revenue from contracts with various clients that have the effect of improving the company image;
- (3) Structure improved by means of relations with customers = weight of income from contracts with various customers which improve organizational structure of the company and involve research and development programs;
- (4) Competencies gained from relationships with customers = weight of revenue from projects undertaken for various clients that have increased the competencies of company employees;
- (5) Weight of professionals = number of professionals (managerial staff and employees entering the company's relationship with its customers) in total company personnel;

- (6) Customer satisfaction index = which quantifies customer satisfaction on a scale from 1 to 6 (highest satisfaction);
- (7) Rotation of professionals = number of professionals who left compared to the number of professionals at the start of the year;
- (8) Frequency of renewed contracts = weight of revenues from customers that the company cooperated with the previous year;
- (9) Administrative Staff turnover = number of administrative staff who left compared to the number of administrative staff at the start of the year;
- (10) Rookie rate = number of employees with less than 2 years of seniority;
- (11) Seniority = number of years as an employee of the company.

Table no. 1. Indicators to measure intangible assets

Every coefficient above can be evaluated through ICT means, i.e. observing continuously each value by collecting human resource related information, one could determine the specific numerical value of the coefficient. The system is, after that, easy to apply to any company just to have a clear idea on the Intellectual Capital evolution in that company. It is also possible to obtain some synthetic values on the state and evolution of the Intellectual Capital of the company in time (Nonaka 1995). So, Intellectual Capital is obviously measured only indirectly from the values one can measure directly from a company.

3 Place of ICT in the Intellectual Capital of the company

It is well known that the technological and organizational structure of the company brings important aspects in the intellectual capital. So, Information Technology and Communications foster knowledge sharing among employees and can contribute to preparing and maintaining efficient processes throughout processes.

Software companies produce various ICT aiding tools for companies, by example related to business processes and business development - such as Business Process Management (BPM) and Business Intelligence (BI) systems. Almost all such aiding tools rely on large volumes of data which the company acquires and keeps along its lifetime through the Enterprise Resource Planning (ERP) systems (Seiber-Hansman 2004). Deriving from that, efficient approaches such as Supply Chain Management (SCM) or Customer Relationship Management (CRM) – along with specific software tools, are sources for new knowledge and for improved quality. Approaches and systems above result from the combined study and work of researchers and practitioners who look for efficient means to produce and manipulate knowledge in the company, i.e. means contributing to the Intellectual Capital growth in the company.

On the other hand, communication means offered by ICT concern messages (as knowledge pieces and carriers for knowledge) transferred inside the company through the intranet and outside company through Internet. Some sociologists (Virilio 1998) observed that the richness of messages (hence of information) existing in the Internet tend to transform the bulk of messages into a specific environment in which the company and the individuals live. So, connected to that environment, the Intellectual Capital of the company is in permanent exchange and growth – if managerial and operational staff understand the idea and use specific tools for that exchange.

However, there are some disadvantages of such an environment of messages and information, while by itself, that environment becomes a benchmark for common knowledge, even the Internet often contains unverified and unauthorized information. Some employees (managers) manifest self-content attitudes when relying only on the Internet and ignore the specialized literature in a specific field, so that environment can be a trap with false knowledge.

When using ICT and its tools a sort of standardization occurs over the company and in each certain field – for example processes, documents, communication and operations. Those standards becomes knowledge part of the Intellectual Capital of the company; employees get well acquainted with it, may get help instantly when performing their jobs, and sometime may contribute to the company management and/or restructuring.

Some top companies even developed special prototyping systems to set up new companies as an IT based process that supports employees in opening and operating an office. Using ICT means the prototyping involves installing a mixture of standard modules into an office, so procedures and routines needed in the business are delivered immediately. The modules shorten time for local product customizing, cover the design and contracts issue, establish accounting procedures, and help to administer the product (Edvinsson 1997).

4 Measures of Intellectual Capital and correlation with ICT usage

The intangible asset monitoring system proposed by Karl-Erik Sveiby has been applied by several Swedish companies. By means of the monitoring system the facts could reflect the impact of the strategy adopted by the company on customer satisfaction, loyalty, the competences gained by employees and their satisfaction etc. It was clear that in a couple of years, a good policy and implementation on the monitoring raised the position of the company in the European top.

However, the problem of brainpower assessment is not solved due to the lack of standardization of most indicators established for that purpose (Burton-Jones 1999). These are non-financial indicators (qualitative) meant to measure the performance of the company and, usually, are result of a case study on a company, sector or economy, under the influence of the analyzed sample characteristics.

Creating a system to measure the qualitative factors, for the overall performance in a unified way within a company, or sector of an economy, requires the availability of standardized information on these qualitative factors. Lack of such information makes this theoretical approach.

Overall, the qualitative factors are considered determinants of the enterprise performance, as latent variables of its profitability. So, identifying the qualitative factors influence on enterprise performance, actually involves identification and evaluation of its intangible assets. In his *As methods for measuring Intangible Assets*, Karl Sveiby (Sveiby 2001) proposes a grouping of intangible asset valuation methods encountered in practice: direct methods for estimating the intellectual capital, estimation methods based on market capitalization, estimation methods based on return on assets, estimation methods based on the scoreboard.



Direct Intellectual Capital Methods – DIC, require assessment of intangible assets of the enterprise by identifying each component. These ingredients are evaluated individually, or as an aggregated coefficient. So,

Market Capitalization Methods – MCM, calculate the difference between the market capitalization of the company and the book value of equity, as the company's intangible assets.

Return on Assets Methods – ROA, calculate the average profit of the enterprise, before tax, and compare with the value of company's assets. Return on assets is compared with the average yield company characteristic industry. Profit that the company derives from the possession of intangible assets is estimated by multiplying the difference between the two ratios by company assets. Present value of future profits of all these is the value of intangible assets owned by it.

Estimation methods based on the scoreboard (*Scorecard Methods* - SC) are used most often to identify the qualitative factors and calculation of performance indicators to measure them. These indicators are used more to medium and long term management of the company to estimate the value of intangible assets owned by it.

ROA and MCM methods are very useful in assessments made during mergers and/or acquisitions, that is estimating the market value of shares. Also, these methods can be used in the comparison between companies within the same sector and to quantify the value of intangible assets held by companies. Their main disadvantage comes just in trying to quantify all factors of performance in enterprise value (qualitative and quantitative). As a result, estimates made by these methods are highly dependent on assumptions taken on the opportunity cost and have no relevance for non-profit organizations or the public sector. DIS and SC methods advantage is the overall presentation of the creditworthiness of state enterprise, beyond the limitations posed by reports focused only on financial indicators. They can be used to estimate the value generated by various events in the company. Because they do not base on quantifying the financial indicators, such methods may be used by non-profit or public sector, in order to quantify their performance both in terms of efficiency of the work and social or environmental impact. Major disadvantage of these methods is the customization of the qualitative performance indicators by type of organization reviewed (that is by its features), so, they lead to very difficult comparisons between companies. Another drawback is the large amount of information to be analyzed to assess the performance of the company through these methods.

In this age of information and technology, the intellectual capital has an increasing share of overall assets in the company. The objective of the traditional company in undertaking a scale economy - regarding its activities, is completed or even substituted by the network economy. Thus, the company profit is primarily the result of the way the company cultivates relations with employees, suppliers, customers and even its competitors.

As it was shown above, ICT is strategically important for the Intellectual Capital in the company, so, it is essential to find out how intensive ICT is. Some indicators used to measure ICT efforts in the company can be: the extent of information systems use in support of business processes over the departments of the company, how intensive is the of ICT in processes and management (the ratio of operations based on ICT to the total number of operations), the financial efforts along the years for ICT (as a rising curve). However, it is difficult to evaluate exactly the growth or the productivity of the company due to ICT means implemented. So, again, some software may relate

over the company lifetime the correlation of ICT assets, their usage and benefits, hence refining a “causal” relation between ICT means and the company wealth.

5 Conclusion

In the global and ever changing economy, nowadays, the Intellectual Capital makes the difference between a competitive company and a stagnant one, so, it worth for the management to realize the importance of the Intellectual Capital and to measure its beneficial aspects. It is shown that Information and Communication Technologies can fertilize the Intellectual Capital, and they come with approaches and instruments that sustain information acquisition, processing and usage, just to enrich the knowledge, to improve business processes, supply chain and relations with customers, to release communication of various forms inside and outside the company. Finally, it is important to find out how intensive the ICT usage is in the company, and which are aspects where ICT means can help and sustain the Intellectual Capital of the company.

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