

## METHODS OF HUMAN CAPITAL MEASUREMENT

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### **Abstract:**

No organization is more valuable than its employees. It is the people, their knowledge, expertise, experience, business relationships that constitute for the most valuable asset of any organization. They ensure its existence, development and competitive advantage. Thus, the question of how to measure this value arises. What in particular and in what way should be measured in order to determine a real value of an organization. Proper value management allows for the correct measurement, provides an opportunity to monitor the tendencies and trends, and also to compare the organizations. The aim of this paper is to present methods of intellectual capital measurement and to investigate the substance of the matter. The paper presents and compares, different methods of intellectual capital measurement used globally. It specifies the advantages and disadvantages of particular methods with reference to its practical application. The analysis allowed for the classification of the selected methods and the establishment of the most appropriate ones, taking into account the specific characteristics of the organization. The methods have been developed for countries with different specifics of managing a business and apply both to international and local companies.

*Keywords: intellectual capital, human capital, measurement methods, human capital management*

# 1. THE ESSENCE OF INTELLECTUAL CAPITAL

The concept of intellectual capital emerged in the eighties of the twentieth century and has been developed and popularized since then. Modern enterprises operating within knowledge economy have devoted increasing attention to intellectual capital, which is although still rather rarely valued and measured. Information concerning intellectual capital are not reflected in the financial statements (Rzempala 2007, pp 230). This results from the difficulty of both measuring intellectual capital and demonstrating the knowledge of enterprises in current financial reporting systems. Accounting, financial reporting focuses on collection and presentation of data concerning the results achieved without a full presentation of intangible assets. In business practice, it appears that the market value of a substantial part of companies is higher than their book value, thus it can be assumed that intellectual capital is the source of this difference.

Therefore, the concept of intellectual capital refers to a relatively young term, which is defined in various ways in the literature. L. Edvinsson and Malone MS (Edvinsson, Malone, 2001, p 39) describe intellectual capital as hidden assets, reflecting the gap between the market and the book value of a company. According to M. Bratnicki (Bratnicki, 2001, p. 111) intellectual capital is the sum of the knowledge held by people forming a community of the company and the practical transformation of this knowledge into components of goodwill. Elżbieta Skrzypek believes that intellectual capital should be defined as intellectual assets - the sum of individual knowledge of employees (Skrzypek, 2009, p. 145). These resources are subject to constant changes, which result from a learning process of the organization. G. Urbanek in turn argues that intellectual capital is an invisible company's resource which produces visible results (Urbanek, 2007, p 38). Intellectual capital is both a knowledge itself, as well as the result of its transformation to intangible assets. T. Stewart defines intellectual capital as intellectual material: knowledge, information, intellectual property and expertise that can be used to create wealth (Jarugowa, 2002, p 58).

Intellectual capital is considered as practical experience, technology, good customer relations and all the skills that allow the company to achieve competitive advantage. Intellectual capital is company's useful knowledge, communication, intuition, and also the feelings and desires. It is closely related to people and results from the combination of competence and motivation.

Intellectual capital covers areas such as market power, market selling, customer loyalty, intellectual properties such as patents, brand value, internal aspects such as corporate culture, management, processes, systems, properties, which originate from employees, such as competence, know-how, knowledge, skills and relationships. In modern economy, intellectual capital has become a source of competitive advantage, and this ensures that companies are increasingly interested in creating complex systems for monitoring and managing knowledge assets. Intellectual capital can be divided into two main parts:

- The first one represents the invisible resources, processes and creates organizational and social capital,
- the second reflects knowledge of people and creates human capital.  
This division corresponds to the unconscious and the conscious (thinking) parts of intellectual capital.

The literature distinguishes four phases of the development of intellectual capital (Jarugowa, Fijałkowska, 2002, pp 64-65):

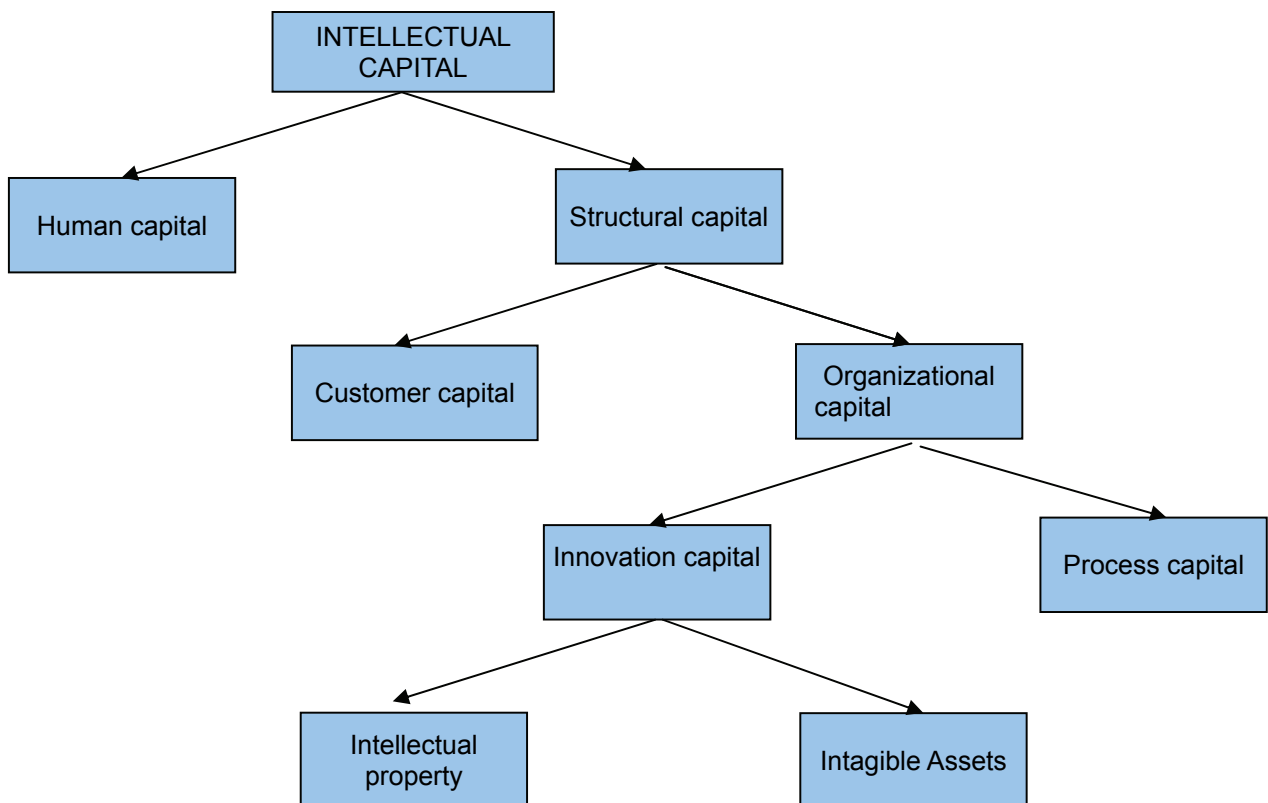
1. Visualization, development of a model representing the areas in which the goodwill is created.
2. Knowledge management by strengthening intellectual capital. This process involves the search for talent, motivating employees to creative action.
3. Converting knowledge into codified information. Creation of a system ensuring that the knowledge of the employees remains at the company even in the event of their leave.
4. 4. Investment in intellectual capital - strengthening.

On the basis of the analysis of intellectual capital it may be concluded that the concept is strictly related to knowledge management. On the basis of analysis of the definition of the concept of intellectual capital it may be concluded that the concept of intellectual capital is strictly related to knowledge management. Knowledge resources are the foundation, the basis for the creation of intellectual capital and its development. Intellectual capital is thus formed on the basis of valuable knowledge management for an organization that is both a component and raw material for the creation

of intellectual capital.

It is worth noting that the concept of human capital is not a homogeneous category and consists of many components. The literature attempts to isolate and describe the components. One of the most popular is the model developed in the Swedish insurance company Skandia, which is believed to be the precursor of intellectual capital research. This company was the first in history to introduce a position of intellectual capital director. It also published a report on the state of intellectual capital, which was an addition to the traditional financial statement. The concept developed by Skandia is based on the assumption that intellectual capital consists of human capital and structural capital. Human capital is the knowledge, skills and experience of our employees and their intelligence, motivation and creativity which are reflected in the development of the company (Patalas-Maliszewska, article 4).

**Figure 1:** Skandia intellectual capital model



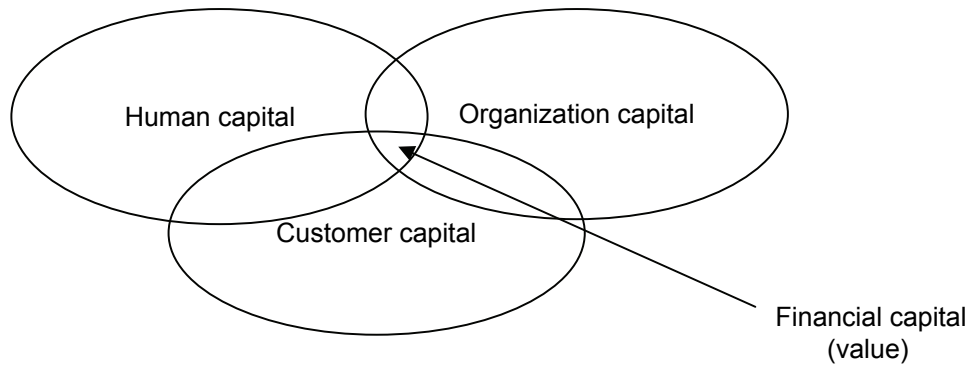
Source: Edvinsson, 1997, No.3.

Structural capital is the organizational capacity to support the productivity of its employees. It consists of a capital in the form of customers (ie customer relations) and organizational capital covering all the tools, systems and procedures that support knowledge flow within the company. Organizational capital is in turn divided into innovative capital and process capital. Process capital, as the name suggests are the processes, procedures, techniques and other tools used to support the effectiveness of production. Innovation capital refers to the ability of renewing the organization in the form of intellectual property, its rights and other assets, the intangible material needed to create innovative products. The approach strongly emphasizes the role of human capital, stressing that it is owned by employees, and the company is only leased.

An interesting concept of intellectual capital is presented by H. Saint-Onge's value platform (Mroziewski, 2008, p 39). The model consists of three basic elements: human capital, organizational capital and customer capital. Synthesis, complementarity and mutual relations can be observed between individual elements of the model. According to the concept, human capital is formed by the competence of the employees. Whereas, customer capital is considered to be a very broad aspect and includes relations with the environment - in particular: contractors, customers, suppliers, partners, and the local community. All elements that remain in the company when employees go home, in

particular: organizational structure, systems, procedures, databases, and intellectual property constitute for organizational capital.

**Figure 2:** Value platform



Source: Mroziewski, 2008.

According to Saint-Onge concept, value arises from the links, flows and the relationship between human capital, organizational capital and customers capital. Liquidation or effective separation of one of the elements causes the inability to produce financial capital.

Separation and proper categorization of individual components of human capital is essential for effective management. Intellectual capital management demands the necessity of defining the company's mission and strategy. It also creates the need to motivate its members towards achieving the goals and coordinated development. The creation of intellectual capital management system should focus on (Skrzypek, 2007, p 6):

- human intellectual capital,
- human capital (employees capital);
- organization capital;
- customer capital;
- acquisition of knowledge from other organizations and individuals;
- continuous acquisition of knowledge and its effective use in the company.

The most significant factor is to establish the circumstances forming the individual elements and the identification of relationships between them. These circumstances determine business profile, industry, available resources, technological potential and customer profile. The mere possession of intangible assets is insufficient for effective development. The mutual interaction and management of the assets is essential. Undoubtedly, human capital is nowadays considered to be the most valuable. Because its the people - that bring knowledge to the company and consequently is the people who develop the company, share experiences. The essence of intellectual capital management is thus to create favourable conditions for generating, accessing and exploiting the potential of knowledge.

## **2. METHODS OF HUMAN CAPITAL MEASUREMENT**

In the nineties of the last century research on discrepancies between book value and market value of the listed entities was conducted. Determination of market potential of the company is a certain measure of the resource use. It was noted that the market value of companies started to be significantly higher than the value derived from the balance sheet. This was confirmed by research conducted by Gartner Group in 1998 (Strojny, 2000, pp 7-8). Thus, attempts have been undertaken of placing intellectual capital in the balance sheet of business entities through the adoption of the following assumptions:

- intellectual capital is a non-financial capital, which is a reflection of the gap between the book value and the market,
- information relating to intellectual capital are complements with respect to financial information

- (but not subordinate information),
- intellectual capital is in the form of liability, not of an asset (property), whereas the goodwill serves as counterweight.

K.E. Sveiby concept is considered the first standard of measurement and presentation of intellectual capital. It includes:

- introduction of the organization scorecard,
- classification of intangible assets in three categories,
- presentation of financial indicators as a fourth category,
- financial or non-financial form of indicators,
- presentation of indicators in a separate supplement,
- invariable traditional finance measurement methods.

To date, over thirty methods of measuring intellectual capital have been developed, but none of them has been considered a standard. Many researchers of intellectual capital claim that there is no need to set the standard in this area.

Selected intellectual capital measurement tools were divided by H. Tan, D. Plowman and P. Hancock into three groups (Mroziewski, 2008, pp 51-66): The first - group of methods, ie. qualitative methods divide the company's intellectual capital to certain spheres according to established criteria. With usage of indicators they value intangible assets in terms of ability to influence development of the company. These include:

1. BSC (Balanced Score Card) of R. Kaplan and D.P. Norton – is used for monitoring the implementation of the strategy through a system of metrics of strategic goals including finance, customers, internal processes, renewal and development.
2. Intangible Assets Monitor – IAM of K.E. Sveiby – image of the organization is described by 24 metrics grouped in twelve fields of a matrix, in which each field is assigned to one of three perspectives: growth, renewal, efficiency, stability.
3. Value Chain Scoreboards of B. Lev.
4. The concept of process evaluation – developed by B. Nogalski and J. Rybicki
5. Assessment model based on quality index system - developed by J. Chen, Z. Zhu, H. Xie.

The second group of methods, ie. financial methods of measurement of intellectual capital in dynamic approach (prospective) is based on the evaluation of future opportunities of intangible resources on the basis of the expected cash flows (B. Lev, D. Andreissen and Tissein, Edvinsson L. and M. Malone). The following models are distinguished:

- The Discounted Cash Flow Model
- Real Options Models ie. measurement of intellectual capital measurement capabilities proposed by L. Edvinsson and M. Malon
- IC Rating (Intellectual Capital Rating) –evaluates various areas of intellectual capital in three perspectives: efficiency, recovery, risk
- The concept of valuation of intangible assets of B. Lev
- Core Competencies method(CC)

The third group of methods for measuring intellectual capital is a financial method in static approach (retrospective). They are used for financial evaluation of intangible assets at current moment. This is a general concept developed by K. Sveiby, D. and M. Williams Luthy. The following models are distinguished:

- Direct intellectual capital methods – DIC
- Market capitalization Methods – MCM
- Return on Assets Methods – ROA

The VAIC (Value Added Intellectual Capital) method seems particularly noteworthy here. It allows to determine the effectiveness of intellectual capital (IEC - Intellectual Capital Efficiency) and its components: human capital, structural, and equipment, and the overall efficiency of the organization. As an extension of the method calculations for relational capital and capital process can be conducted:

- CEE (Capital Employed Efficiency for company) – efficiency of capital employed– determines the rate of efficiency equity capital, understood as a measurement of the above mentioned aspects in creation of added value.

- HCE (Human Capital Efficiency for company) – the effectiveness of human capital – stands for the efficiency rate of human capital utilization, which shows the importance of human capital in the development of added value in the company.
- SCE (Structural Capital Efficiency for company) – structural capital efficiency rate, which is a measure of structural capital efficiency employment in the development of added value in economic entity.

$$VAIC = CEE + HCE + SCE$$

$$CEE = VA/CE$$

$$HCE = VA/HC$$

Where HC is the sum of the expenditure incurred for the company's employees

$$SCE = SC/VA$$

Where SC is a structural capital

$$SC = VA - HC$$

Where VA is Value Added ie sales revenue – operating expenses excluding payroll.

VAIC (Value Added Intellectual Coefficient) factor stands for intellectual added value indicator that allows for the assessment of effectiveness the company's use of all resources and their components in the development of added value (Pulic).

The area of measuring intellectual capital should affect its characteristics, in which are interested stakeholders, and the indicators describing the intellectual capital should be correlated with the financial condition (Ross, 2006). Research results recommend application of VAIC method (Plownam, Hancock, 2007). This is because it is consistent with the three financial parameters, i.e. .EPS, ROE, ASR where:

- EPS (Earnings per share)
- ROE (Return od Equity)
- ASR (Annual Stock Return) - annual rate of return in respect of shares held by shareholders.

The expected results of intellectual capital measurement include the qualitative and quantitative effects. Quality effects include: improved working environment, increased staff confidence, improving the quality of processes, increased flexibility, increased business security, reduced operational risk, better use of resources, better response to market signals, better relationships with customers and suppliers. Quantitative effects include: cost savings, increased productivity, revenue, profits, and market value (Kasiewicz, 2008, p 51).

### 3. CONCLUSION

Selection of the appropriate method of measuring intellectual capital is not simple. A necessary condition is to understand the essence of intellectual capital and to determine the extent to which the various methods can be used. Measurement and management of intellectual capital is not a straightforward process but it is worth to devoting attention since the assets creating intellectual capital have significant impact on the formation of the company's market value. Consciousness of what constitutes the essence of intellectual capital and how it is used in the enterprise allows for better management of those assets and the opportunity to increase the attractiveness of the company in the eyes of employees and potential investors.

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