

Intellectual Capital During the Worldwide Economic Crisis

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Abstract: Reality revealed a very important resource that can act for or against a business, its administration having a crucial influence. It is the intellectual capital we are talking about, mainly based on knowledge.

Under the current economic situation we have to find that ideal solution that is able to get the economy out of the crisis, to find the blue ocean. The main question here is that if a correct evaluation of intellectual capital will help economies get their goals.

The main idea we can withdraw out of these theories is that values have changed the hierarchy, that is the physical resources ceased their place to intangible assets that tend to become more and more important for the companies.

Key words: capital intellectual, know-how, human capital, structural capital, relational capital, fuzzy analysis.

1. The present state of research

"Intellectual Capital is the new currency of the millennium. Its correct usage is the key to success in Knowledge era". (Nick Bontis, Manager, The Research Institute for Intellectual Capital)

This is exactly why it can be seen as the hidden value of an organization, unable to be measured up to now.

Can this resource help us anticipate the decline of a company or even avoid it? Is the intelligent usage of this capital the key to avoiding bankruptcy?

Before the industrial revolution the economy was facing major declines and the economists could not see any way out. It looks like once again we are in a time of economic crisis out of which we can get with a correct management of our available resources.

The idea of intellectual capital first appeared during the 1990s. By the time we reached the middle of the decade it was more and more obvious that there were two separate ways to deal with intellectual capital; and even as such we could distinguish a bonding between them.

One was about information, the power of mind concentrating towards creation and extending the creation inside the company. The other one, based on resources was focused towards getting profit out of the unique combinations between intellectual capital and tangible assets.

Later on they have defined three basic components of this capital: the human capital, intellectual capital and relationship capital. These three components evaluate the intangible assets and reevaluate the informational voids to enhance the competitive advantage.

Organizational culture must embrace creation, innovation, transfer and reuse of information and knowledge in order to take maximum advantage of all that intellectual capital has to offer.

A couple of the intangible assets that compose the intellectual capital are: the employee ability to create, the employee ability to execute, manufacturing technology, internal procedures and rules, the capacity to maintain company performances, the capacity to adapt to novelties, the capacity to influence demand, the degree of participation in the market, the capacity to prospect the

market, own prognosis, the capacity to diversify the offer.

Up to now they have defined around 130 such components of intellectual capital.

2. Evaluation models for intellectual capital

The first company that tried to build a model for measuring intellectual was Skandia, a swedish company that implemented this model, trying somehow to connect the accounting system with intellectual capital. Unfortunately, not up to the present day did they manage to agree with authorized accountants upon the way to quantify the human capital and introduce it in the balance of a company, under invisible actions.

Edvinsson, the creator of this model, at that time employed at Skandia, saw the potential offered by this capital and continued research outside the company. In 1998 Edvinsson was named "Brained of the Year", in detriment of Bill Gates.

Skandia Navigator model divides the market value into financial capital and intellectual capital. This one, in its turn, divides into human and structural capital (formed of innovation capital and process capital).

The second model that appeared on this subject is that of Sveiby, that approaches this theme more practically. He correlates the three types of actives and helped by his programme he helps the small and medium sized companies to better understand the true structure of the invisible capital.

In the attempt to quantify the intellectual capital of a nation we can identify a large amount of indicators, divided accordingly to the patrimony that they belong to: scientific, educational, cultural, of health, cultural-sport and confessional.

A new approach of strategic management was developed at the beginning of the 1990s by doctor Rober Kaplan and David Norton. They named it the Balanced Scorecard. Admitting the weaknesses of the previous approaches this method offers a clear vision of what the companies should measure to balance the financial perspective.

The technological broker introduced by Annie Brooking brings a practice contribution offering three models for measuring in order to help calculate the dollar value of Intellectual Capital. Brooking offers a practice contribution to the measurement of Intellectual Capital and defines it as a moulding of its four components-market shares, human oriented actives, intellectual actives and infrastructure actives.

The competition in the attempt to measure intellectual capital is amazing. They have created different measuring instruments , suited unfortunately only to specific applications. These include:

2.1. Management risk matrix and the Boston consultancy group

This is a technique that uses a cadran divided into four to show performances. The chosen variables for the two axes must be correlated. Unfortunately, the methods used by this consultancy group are called by specialists as arbitrary.

The Kepner-Trigoe decision process brings in front key criterias for a selection process and uses a numerical scale to classify the choices. This method is very useful when trying to solve problems through identifying potential causes. This approach illustrates the importance of a well defined criteria and correctly divide into two categories-musts and wants.

The Blake managerial grill-shows the subjectivity of internal organizations in companies.

The Myers Briggs personality test-used to enhance the dynamic of a group.

In the last years the sector with the most significant growth is without a doubt that of knowledge. Intellectual capital is the key to the development of companies.

Those who understood this reorientated their activity from the service area to the knowledge area and had only winnings. The companies in this field do not produce anything , they do not sell tangible objects, but employee knowledge.

The knowledge based organizations belong to a subgroup in the service area. This sector is not a discreet phenomenon but more like an area of types of companies from the ones totally adapted to its clients to the ones that refined their output and presented it differently.The latters belong more to the classic type of organizations.

In the last decades they concluded that the tangible assets are just a part of a company's or nation's fortune. The accounting value of a company often wrongly represents its power, either by neglecting its potential future or in some cases by assuming of an unreal lifetime of production processes. Out of Top 500 companies in 1954 , 360 no longer appear in similar tops done nowadays. The problem is now if a better understanding of our intangible assets can help us forecast a decline.

Between tangible assets and intellectual capital there is a major distinction. Tangible assets have an intrinsic value independent of the one that analyses them. However, the value of intellectual capital mostly depends on the one that analyses it. The tangible ones

lose their value in time, unlike the intangible ones, that gain it.

The classic companies have a logic based on efficiency, pre-programmed industrial production whose main target is the large amount of people. McDonald's exemplifies this the most, as even the smile we received as clients is pre-programmed in the employee manual.

On the other side there are the knowledge based companies. The service is the result of a continuous process, of a permanent team work between clients and experts. Companies must treat their clients individually. Knowledge based companies cannot force the clients to adapt to re-established services and outputs.

The production of knowledge based companies is in fact the solving of the problems that are hard to solve in a classic manner. The employee must be well trained.

The production of these companies depends only on the way these managers look at both the clients and employees.

The logic of knowledge based organizations is on short:

- 1) Attract the personnel.
- 2) Attract the clients.
- 3) Match the clients with the personnel and create that chemistry.

These companies hire extremely educated people whose only target is the solving of their clients problems. Most oftenly they process information.

The result of this rocessing is not tangible as a product and generally is part of certain repts. The most obvious result s the growt of the client's business.

We cannot talk about a quatification of the inputs of these societies. They have not up to now found any suited indicators to

quantify these inputs or the outputs. The lack of these indicators is known and accepted. Thisnis how they explain the lack of adta available. However they must not neglect the investment in intangible assets. All investments imly a transfer of liquidities.

When a knowledge based organization invests in intangible assets such as know how, the accountants do not allow to introduce that value in the balance sheet, so the investment will have an invisible correspondent. The investment will be represented by a negative cash flow and a loss in the winning and losses account.

We must also remark that the specialists in knowledge based companies consider that training is not only a waste of time but also of money. They would rather recommend a more expensive investment in research and development, but this one would worth its expense in time.

Both type of investments have the same effect-sacrifice the profitability on the short run for that on the long run.

2.2. Tango simulation

Knowledge based organizations invest a great deal in intangibile assets. This can only be done through sacrifices such as:

- 1) Expense balance-will grow the costs for interests.
- 2) The giving up of a capacity that would otherwise produce an income.
- 3) Pay more then necessary for the solv ing of your clients problems.

The profit of these organizations is generated by the management of intangible assets. This is the most obvious difference from the classic type of organizations whose profits are based on tangible capital. This difference

is the most important as all the models we use nowadays are based in tangible assets.

Tango offers a model that clarifies the logic of functioning of these knowledge based organizations and define specific factors that grow profitability. These include tangible factors such as capacity, but also critical intangible factors such as image, know how, personal chemistry and individual structure.

The know how of a company is divided into two categories: organizational and professional. The professional one is made up of systems, rules, programmes, manuals, concepts, etc that have been developed by professionals as individual research and development projects. In a law firm these rules are actually standards for contracts, in a laboratory they are systems and testing mechanisms.

The most important characteristic of this know how is that the systems cannot be bought from the outside, are unique for every organization and are part of it. A great deal of a knowledge company's success depends on the level of education of their employees in order to use this know how more efficient than their competitors.

Organizational know how is also useful otherwise knowledge based companies shall not survive. It includes creation strategies, marketing, planning, accounting, management, etc. The value of organizational know how is measured through the ability of the company to maintain and grow the total value of an organization.

In TANGO the organizational know how is represented by the total amount of knowledge and ability that one brings with and the ones that he learns during the simulation.

Participants in TANGO see how intangible factors are directly related to financial results and learn practical strategies to manage them. The biggest mistake that a knowledge based organization can do is to concentrate solely on the clients.

Unlike in the manufacturing industries, the knowledge based organizations cannot afford to concentrate too much only upon their clients, that is because these organizations are in a permanent challenge on two markets: the market for clients and the market for key employees.

3. Fuzzy analysis

At a microeconomic level we can use fuzzy analysis to quantify the value of intellectual capital.

Let the time series $\{X_t\} = \{0.8; 1.4; 2.8; 3.6; 4.2; 3.6; 4.3\}$ that represent the variation of the benefits taken by the employees during the past 7 months. The total range is $4.3 - 0.8 = 5.5$. We shall divide $[0.8 ; 4.3]$ in equal parts.

$$U = \{(0,1), (1,2), (2,3), (3,4), (4,5)\}$$

The linguistic variance according to these series is:

- Very low = $L_1 \in (0,1]$
- low = $L_2 \in (1,2]$
- medium = $L_3 \in (2,3]$
- high = $L_4 \in (3,4]$
- very high = $L_5 \in (4,5]$

The medium for each partition is $\{m_1 = 0.5; m_2 = 1.5; m_3 = 2.5; m_4 = 3.5; m_5 = 4.5\}$

$$X_1 \in (0.5, 1.5), \text{ so } \frac{1.5 - 0.8}{1.5 - 0.5} = 0.7 \in L_1 \text{ and}$$

$$\frac{0.8 - 0.5}{1.5 - 0.5} = 0.3 \in L_2$$

The fuzzy value for X_1 is $F_1 = (0.7; 0.3; 0; 0; 0)$
 $X_2 = 1.4, X_2 \in (0.5, 1.5), F_2 = (0; 0.1; 0.9; 0; 0)$

Similarly

$$F_3 = (0;0;0.7;0.3;0);$$

$$F_4 = (0;0;0;0.9;0.1);$$

$$F_5 = (0;0;0;0.3;0.7);$$

$$F_6 = (0;0;0;0.1;0.9);$$

$$F_7 = (0;0;0;0.2;0.8).$$

Table 1

	Very low=1	Low=2	Medium=3	High=4	Very high=5
F_1	0.7	0.3	0	0	0
F_2	0	0.1	0.9	0	0
F_3	0	0	0.7	0.3	0
F_4	0	0	0	0.9	0.1
F_5	0	0	0	0.3	0.7
F_6	0	0	0	0.1	0.9
F_7	0	0	0	0.2	0.8

$$E(x) = \frac{\frac{0.7}{1} + \frac{0.4}{2} + \frac{1.6}{3} + \frac{1.8}{4} + \frac{2.5}{5}}{5}$$

$$E(x) = \frac{0.1}{1} + \frac{0.06}{2} + \frac{0.23}{3} + \frac{0.26}{4} + \frac{0.36}{5}$$

4. Conclusions

The use of fuzzy analysis helps to a better understanding of actual phenomenons on

the work market and last but not least to an objective analysis of the current situation.

Unlike the previous methods used to measure intellectual capital , which have been considered as arbitrary, subjective and not fitted to a company's unique profile, the questionnaires created for the evaluation on intellectual capital using the fuzzy analysis assure an unique result based on each client's inputs and outputs.

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