

Identification, measurement and management of intellectual capital is a vital important issue for the survival of organization in the field of competition

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Abstract: In the global economy pattern which is based on knowledge and information technology, the intangible assets can be the most important factor in the organizations' success in the field of competition. The physical and financial are replaced by intellectual capital in this pattern and it is considered as the source of value for organizations. Therefore, the key factor in organizations' success in competitions is identification and measurement of these intellectual capitals on time and managing it. So, first we explore the intellectual capital concepts and present the intellectual capital history then the intellectual capital according to theorists and three basic elements of intellectual capital including human capital, structural capital and relational capital are defined and the intellectual capital measurement methods are briefly presented and finally the intellectual capital management is discussed.

[Ebrahim Alizadeh. **Identification, measurement and management of intellectual capital is a vital important issue for the survival of organization in the field of competition** *Life Sci J* 2012;9(4):761-765] (ISSN:1097-8135). <http://www.lifesciencesite.com>. 120

Keywords: intangible assets, intellectual capital, human capital, structural capital, relational capital.

1. Introduction

The competition expansion between organizations along with the information technology revelation has caused the change in the global economy growth. In this new economy pattern, the physical and financial capitals are replaced by the intellectual capital which is the most important capital.

In the knowledge-based economy, the organizations act on the basis of the knowledge and the most successful organizations are those which use these intangible assets in the best way and faster than other organizations. Therefore, the present and the future success in the competition of organizations mostly depend on the management of this intellectual capital.

According to traditional financial reporting, the value of a firm is summarized the balance sheet while nowadays, the real value of firm is more than tangible assets which are recorded on the balance sheet. Nowadays this value equal's recorded tangible assets plus not recorded intangible assets.

The increasing difference between real market value and its assets net book value on balance sheet which is intellectual intangible assets caused most of the organization look for a new method to measure the intangible assets in which the new apparent field of intellectual capital is focused.

2. Intellectual capital theoretical aspects

For better understanding of intellectual capital, first the organizations, assets are divided in to two categories as follow:

a. the physical and financial assets which are usually presented on balance sheet.

b. intangible assets which are divided in to two categories:

b1: the intangible assets which are recorded on balance sheet as intellectual properties like copy right, patent and goodwill.

b2: the intangible assets which are called intellectual capital and are not recorded on balance sheet.[9]

The intellectual capital is the available knowledge in an organization in especial time and is a kind of valuable asset which is known as intangible asset of organization. Intellectual capital is more than physical assets and is a kind of valuable asset that is a basis for understanding the intangible assets of organization. Those organizations which can manage these assets well, are in a better situation in companion to competitors. Intellectual capital deals with the managing of these assets. Intellectual capital and knowledge management are the important factors in determining the value of organizations and long-term planning. Intellectual capital helps organizations to use intangible assets to create value for organization. Intellectual capital includes market intangible assets, intellectual properties, human capital and structural capital which enable the organization to accomplish its activities and duties.

Therefore, the intellectual capital means the sum of individual's knowledge in the organization and the use of this knowledge in managing and wealth making for organization.

2-1-Intellectual capital history

The intellectual capital was presented by the famous economist, Galbraith to explain the difference

between market value and book value of the organization for the first time. Of course, Peter Drucker used the term “knowledge employee” before him. [3]

In 1995 the first organization which measures its intellectual capital was the biggest insurance company in Swidden called Skandia. Then the Canada commercial bank, one of the seven biggest American bank, provided a plain in which only the companies could receive loan that were valued on the basis of

intellectual capital. Many studies have been conducted on intellectual capital from that time and in early 2000. The first intellectual capital standard was published by Denmark and the first Intellectual capital record was reported.

2-2- Intellectual capital definition

There are definitions of Intellectual capital by famous theorists which are listed in the following table:

Table 1-the Intellectual capital delimitation by theorists

N	Researcher	Definition
1	Smith.M,(2007)	is a part of organizations assets that causes winning in the competition along with tangible assts
2	Booking.A(1997)	Intellectual capital is the combination of market values, human capital and structural capital
3	Edvinsson (1997)	Intellectual capital includes the assets that aren't physical but are the source of value creation for the organization
4	Svieby.K.E(1997)	Intellectual capital is the immaterial values including employees merits, internal and external structure
5	Pretty. R. and Guthire, J (2000)	Intellectual capital in the economy value of two categories of assets: structural capital and human capital
6	Sullivan.P(2000)	Intellectual capital the knowledge that can be turned into profit
7	Papulus(2003)	Intellectual capital is the difference between market value and book value of the organization
8	Klein.D.A(1994)	Intellectual capital is the intellectual ability that is used for more valuable asset making
9	Bontis.N(1998)	Intellectual capital is the researching and following the effective use of knowledge (final product)in comparison to information
10	Roos.G(1997)	Intellectual capital all the processes and assets that are not recorded on balance sheet traditionally. Also, it includes those categories of intangible assets like: patents, copyright, etc that follow the modern accounting methods.
11	Seetharaman. A(2002)	Intellectual capital is resulted from the difference between market value of an enterprise and replacing expenses of the assets.
12	Dierickx and Cool (1989)	Intellectual capital is the process of knowledge inside the organization

According to the above -mentioned definition by theorists in the table, it can be said that the intellectual capital consists of all knowledge resources that make value for organization, but are not recorded on balance sheet in traditional accounting.

(E.g. experience, relationship with the customers, employees, skills) and also includes all intangible assets (e.g. patent, copy right) which are used in modern accounting.

2-3- Main element of Intellectual capital

Most of the theorists consider the Intellectual capital as the combination of three main elements, that is, human capital, structural capital and relational capital and believe that balance and cooperation between these three elements produce value for the organization the mentioned elements are explained below.

2-3-1-Human capital

Human capital is one of the principle categories of Intellectual capital. This category encompasses all knowledge held and contributed by the employees of an organization. There are a number of ways to describe this knowledge such as education, and experience.

Human capital is the source of value producing. This capital is based on the individual's talents in the organization and its amount depends on the knowledge of individuals in the organization.

Human capital is the knowledge of a person to find the best solutions. That's why when the experienced individuals quit the organization, the organizations quality decreases and the organization downgrades. Of Course the human Capital are not owned by the organization become if a programmer

write a program at home can “the organization claim that program belongs to the organization?”

2-3-2- Structure capital

The structure capital can be divided into two categories:

- a. Fundamental assets such as technology and working methods
- b. Intellectual properties such as technical knowledge, trading market and patents.

Therefore, structure capital encompasses all nonhuman resources in the organization including guidelines, policies, organizational chart, operational plans. As its mentioned the human capital contains employees experience and knowledge in the organization which are at the service of the organization in the working hours. The structure capital is the ability and revisiting knowledge in the firm that is owned by firm and remains in the firm after the employees leave it. [14]

2-3-3- Relational capital

The relational capital is the existing knowledge in the marketing channels and the relationship with the customers.

This capital encompasses the current value and the future of the relationship with customers. The customer satisfaction maintains the commercial relationship of the firm and improves the validity of the firm in the market. Of course relational capital growth requires the support of human capital and structural capital, that is, the structural and human capital help organizations to develop the relational capital and relational capital development also improves the performance of the firm. In fact, no value produced in market without relational structure. Overall the relational capital is an image of all assets that manage the firm relationship with it’s the outside environment. This capital contains the relationship with customers, stockholders, competitors and the society. [1]

Therefore, the components of intellectual capital can be presented as the following:

Diagram 1-intellectual capital components

Intellectual capital

Human capital	Structural capital	Relational capital
Knowledge & skill	organizational culture	Formal relationship
working experience	guidelines	informal relationship
customer satisfaction	information systems	partners
training	trading mark	reputation
job creativity	working methods	firm validity
capability	Research & development	customer loyalty

3. Intellectual capital measurement methods

In the knowledge-based economy, the success of the organizations depends on the ability to manage the intangible assets (intellectual capital) and to be able to manage these assets, first they should be identified and measured. many methods have been presented by theorists to measure the intellectual capital. Some of these methods are briefly explained:

Intangible asset monitor

According to this model, great part of the firm value referred to the knowledge-based intangible assets. it means that market value of a firm equals the equity plus three types of intangible assets, external structure, internal structure and individual capability. [17]

Balanced scorecard (bse)

On the basis of this method, financial indicators alone are not enough to show the firm value.

Because these indicators do not show the previous events of the firm. Balanced scorecard is used to balance the firm goals through considering the four aspects of financial, customer, internal processes,

learning, and development. Therefore, a balance is made between the Rotors perceive indicators (financial indicators) and prospective in dictators customer, internal praxes [6].

Intellectual capital index

This index is a measurement method dependent on the individual thinking that tries' to link the Intellectual capital changes and the market value changes of the firm. Thus, if this index can not reflect the market value changes of the firm, it reforms itself. Therefore, this index helps managers to measure the Intellectual capital of the firm and judge about it and also it pares the way for the comparison between the organization and economy units. [12].

Skandia navigator

The Swedish financial services firm Skandia provides an interesting example of a firm that may be showing the way to the future, by regularly valuing and reporting on their intellectual capital of the knowledge and expertise within the organization.

On the basis of this model, Intellectual capital is divided into two types:

- 1- Human capital

2- Structure capital

Human capital is in the heads of employees. Structural capital remains in the organization. It should be mentioned that the structure capital itself is divided into customer capital, deriving from the relationship the company enjoys with its customers, and organizational capital schwas' guidelines, policies, organizational chart and operational plan

At Skandia, human capital is further divided into several elements:

Customer focus, process focus and renewal and development focus. In this model, the intellectual capital is a combination of human capital, i.e. the brains, skills, insights and potential of those in an organization and structure capital, i.e. things like the process wrapped up in customers, processes, databases, brands, systems, patent and trading marks.

Value added intellectual capital

Value added intellectual capital was developed by Ante public (2000 and 2003). He operates only in the realm of money and is genuinely interested in the economic value and efficiency of intellectual capital.

In this model the added value is resulted from the difference between input and output [11]:

Value added (VA) = output - input

By input we mean the revenue derived from the goods and services sale and by output we mean all the expenses used for production of goods and services accepts salary cost and depreciation expense. Thus, the added value is:

Value added (VA) = operating profit + salary costs + depreciation expense

The value added coefficient of intellectual capital contains the following components:

- a. Value added capital coefficient (VACA): this coefficient shows the value added created as the result of physical assets usage which is presented as follow:

$$VACA = \frac{VA}{CA} = \frac{\text{value added}}{\text{tangible assets}}$$

- b. Human capital coefficient (VAHU): This coefficient shows the value added by employees which is calculated as follow:

$$VAHU = \frac{VA}{HU} = \frac{\text{Value added}}{\text{Salary costs}}$$

- c. Structural capital coefficient (STVA): This coefficient displays the value added resulted from processes and structure in the organization. Structural capital and efficient

coefficient of structural capital is calculated as follow:

Structural capital = value added – salary costs

$$STVA = \frac{SC}{VA} = \frac{\text{Structural capital}}{\text{value added}}$$

Therefore, on the basis of public model, intellectual capital is:

$$VAIC = VACA + VAHU + \frac{STV}{A}$$

Q-TOBIN Model

Tobin's q was developed by James Tobin in 1969 as the ratio between the market value and replacement value of the same physical assets. It is supposed that the market value of the firm equals the book value of the firm. If the market value reflected only the recorded assets of the company, Tobin's q would be 1. If Tobin's q is greater than 1, then the market value company's recorded assets. If Tobin q is Less than, the market value the recorded value of the assets of the company. This suggest that market may be under valuing the company.

This suggests that the market value reflects some unmeasured or unrecorded assets of the company. High Tobin's q values encourages companies invest more in capital because they are "Worth" more than the price they paid for them. The high Tobin's q values in every firm show the investment ratio and technology.

Auditing CI based on Broker Technology

Broking evaluates the intellectual capital value of the organization through diagnostic assessment analysis and analyses the organizations response to twenty questions related to four components of intellectual capital. Intellectual capital encompasses four components:

Market assets: trading marks, customers, distribution methods and trading cooperation's.

Human assets: trading, knowledge and individuals capabilities. Intellectual properties: patent, copy right and trading secrets.

Structural assets: contains a set of management processes. information technology, computer network and financial systems.[2].

4-Organization Intellectual capital Management

Intellectual capital management movement began from Japan by Hiroki Itarni. Hiroki studied the effect of intangible assets on the Japanese firms management. Then, the perspectives of famous economists such as Penrose, Ernerflet, Ausubel on organization valuing based on employees knowledge and capabilities were presented.

In recent years the direction of the economy implies the in human resources, research and

development and information technology. In fact the source of creating the economy value is producing in tangible assets and managing them which are called intellectual capital.

Intellectual capital management helps the organizations to identify their capabilities, maintain and reconstruct them over time.

Several models were presented for intellectual capital management. One of these models is intellectual capital model of Kim, D. Kumer. This model includes six stages:

1. Management Responsibility: It means the intellectual capital manager should plan on the basis of the needs estimating of customers.
2. Resource management: of organization. This is the science of allocating resources among various project or business units, maximizing the utilization of available personnel resources to achieve business goal.
- 3- IC Indicator Development: To determine these indicators two principles are taken into account: first indicators should be measurable, practical and objective and second the intellectual capital indicators should be taken into account in the research and development process.
- 4- Measurement and monitoring: After specifying the indicators, intellectual capital team of organization and research and development team monitor the indicators measurement. Indicators measurement is done in internal and external environment and statistical methods like regression is used to analyze the data.
- 5- Communication: communication is the result of intellectual capital management which is published in the form of intellectual capital statement in the organization and is a common language among all members of the organization.
- 6- Continuous improvement: Intellectual capital management in this stage tries to make the intellectual capital and permanent throughout the organization.[7]

Therefore, intellectual capital management not only defines and measures the assets and knowledge, but also leads the control and continuous improvement directing of wisdom. In other word, intellectual capital management is the discovering development and improvement process of value in organization.

Result

In business a lot of organizations have concluded that correct measurement and management of intellectual capital can guarantee the survival of

organization in competition and is an important factor for winning the game. Intellectual capital of an organization contains three components of human capital, structural capital and relational capital the correct managing of these capitals not only causes the effective internal dominance but also strengthen the external relationship of organization with customers creditors and beneficiaries. Thus, due to the intellectual capital importance, organizations should try to specify and measure these capitals and then manage them in the best way.

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