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A Theoric Study About Management and Measurement of Intellectual Capital

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Abstract: With the winds of global competition, individual and mass improvements that experienced in the transition to the information society caused occurence of many concepts. In the other words, the improvements in the communication and information technologies caused strong fundamental changes by affecting organizations' structures, functioning and competitiveness. With these changes, new formations occured and intellectual capital are started to be considered. All these improvements and changes connected the future of today's organizations to intellectual capital which has been known as the capability and power of producing the knowledge and converting it to a source of wealth. In today's information age, to have the intellectual capital is so important. It became more important with management improvement of it and becoming more visible as it gives an advantage of competition and an increase of market value to the organizations. Fort this purpose, in this study, the concept of intellectual capital and management and measurement of intellectual capital have been defined as a theoretical perspective. The change and development of the point of view to intellectual capital concept has been defined.

Keywords: *Intellectual Capital, Human Capital, Structural Capital, Customer Capital*

1. Introductıon

As a natural consequence of shifting from industrial era to information era, information became a key point in achiving and keeping up competitive advantages at organizational level. This situation requires organizations also to invest in intangible assets like intellectual capital with tangible assets. Indeed, 21st century's new management paradigm is information and intellectual capital. Intellectual capital is mentioned as a relatively new concept in organizations. However, previous researches indicates that intangible resources like human capital and organizational learning have already been emphasized. (Snell & Dean, 1992). During the past five years, it is known that numerous efforts have been made on information management role in organizations that have more successful business units. For a succesful organization, knowledge-based perspective is essential (Delgado-verde et al., 2011). In the global world which is in the process of transforming into an information society, knowledge-based organizations have main features. These features can be listed as an intensive learning desire, to devote oneself to produce and transfer new information, to be open to the environment and continuos learning habit, to have a vision shared by everyone within the organization (Saruhan & Sulaoğlu, 2001). Human capital is the key point of intellectual capital. It came forward that human capital is important in the competitiveness of organizations. With the emergence of the concept of intellectual capital, various changes have emerged in the management approach of organizations. Human element that has become even more important with intellectual capital had been effective in this case. Human element has received a more central status and has taken its rightful place in the organizations as an important element. The importance of intellectual capital concept will increase as organizations keep discovering their most valuable resource "human". With this point of view, this study may provide important contributions to literature in terms of monitoring the development of intellectual capital with the help of recent studies on the same subject.

2. Lıterature Revıew

Intellectual Capital Concept: In today's changing and developing world, to be the pioneer in catching up the innovation is so important.The basic requirement to achieve this is to be possessed of knowledge and the source of the knowledge. With experiencing the transform from industrial society to information society, knowledge is taking important roles in production and being used as a strategic competition factor by organizations. According to Drucker, by the end of 19th and begining of 20th century, processing and analysing the information by personal computers became as much important as the other changes in other fields (Drucker, 1998). With the usage of information effectively, a new structuring effect

came forward and this called information economy. Organizations' intangible assets with their tangible assets became more important with the economic restructuring that the information economy brought. During this process, the difference between organizations' market value and book value reduced and the ratio of intangible assets in total assets reached higher levels. According to this, also the ratio of intangible assets raised in determinig the market value of the organizations. It is possible to say that the success of organizations' depends on the leverage effect of intellectual capital (Öztürk & Demirgüneş, 2008). It is not possible to see intangible assets on organizations' balance sheets and income tables. The globalization of the economy as a distinctive element in production, increased the value of the organizations' proprietary information and this transfom reduced the costs of providing the communication network. According to this scope, intellectual capital concept is coming forward as a unique concept which gives a competitive advantage to organizations (Acuner & Tan Sahin, 2002).

The concept of intellectual capital that first used in 1960s, was lagged behind other organizational issues. In 1980, while searching answers for questions like how to create new and different values for organizations and how to use these values more effective and efficient, intellectual capital concept came forward again. Intangible assets' tangible outcomes have been examined in the context of intellectual capital (Sullivan, 2000). The concept of intellectual capital was purposed for the first time by famous American economist James K. Galbraith in 1969. He thought that Intellectual Capital was not only a kind of static intangible asset in itself, but a kind of dynamic capital without fixed capital form, and it is the process effectively utilizing knowledge, and a kind of measure to realize the target (Ding & Li, 2010). The concept of intellectual capital has several definitions in literature. However, the most referred one is Thomas Stewart's. According to Stewart, intellectual capital is any kind of intellectual material like knowledge, information, intellectual property, individual skills and experience which can be included in the process of production to create wealth (Stewart, 2000). According to Bontis and others, intellectual capital is to classify all intangible assets in organization as human capital, structural capital and customer capital (Bontis, 1998). According to another definiton; intellectual capital is the information that shared by organization members and that can be converted to competitive advantages and profitability, and is the total of the organizational processes that based on this information (Demediuk & Sims, 2003). Intellectual capital is related to the sustainable competitive advantage of organizations and being related to organizations' sources, capacity and perfection (Cabrita & Vaz, 2006). The last definition of intellectual capital has been done by Mojtahedi and Ashrafipour. They defined it as: Intellectual capital is the group of knowledge assets that are attributed to an organization and most significantly contribute to an improved competitive position of this organization by adding value to defined key stakeholders (Mojtahedi & Ashrafipour, 2013).

Intellectual Capital Elements: To find, understand and manage the concept of intellectual capital effectively, first the elements that create intellectual capital should be defined (Stewart, 2000). The reason to classify intellectual capital is the usage of intangible assets of the organizations' by supervisors. There are several different evaluations in literature about the elements of intellectual capital but, the basic classification is same.

Table 1: Detailed Intelectual Capital Elements (Herman, 2003)

INTELLECTUAL CAPITAL			
MARKET ASSETS	**HUMAN ASSETS**	**INTELLECTUAL PROPERTY ASSETS**	**INFRASTRUCTURE ASSETS**
Brands Customers Distribution Channels Job Cooperations	Education Job Knowledge Qualifications	Patents Copyrights Trade Secrets	Management Processes Information Tech. Sys. Networks Financial Systems

Generally accepted basic 3 elements are: human capital, structural capital and customer capital (Bontis et al., 2000).

Human Capital: As one of the basic element of intellectual capital, human capital means the total of human elements like experience, skill and knowledge of organization personnel. Some of these elements that personnel have can be typical and some can be common. For example like; innovation capacity, creativity, past experiences, teamwork capacity, job flexibility, motivation, job satisfaction, learning capacity, loyalty, formal education and training (Mojtahedi & Ashrafipour, 2013).

Structural Capital: This type of capital is defined as the information that stay within the organization. According to another definition, structural capital is the management and implementation system to create an organization ambience that encourages organization personnel and creates an organization loyalty (Kanıbir, 2004). Organizational flexibility, the presence of information centers, the general usage of information technology and organizational learning capacity like organizational routines, systems, cultures and databases creates structural capital. Some of these can be protected legally and may become a legal intellectual wealth (Salleh & Selamat, 2007; Chen & Min, 2004). One of the duties of organization managers is to collect information within organization and to ensure that it become organization's property. According to Stewart, if information can be provided as the property of the organization, structural capital will also be created. In short, structural capital always stays in the organization. It belongs to the organization, can be shared and at the same time producable (Stewart, 2000). In the organizations which cannot create structural capital, intellectual capital becomes consist of only human capital. Structural capital contains structures like elements of efficiency, transaction times, procedural innovativeness and access to information for codification into knowledge (Bontis, 1998).

Customer Capital: Customer capial is not limited only with customer relationship, it also contains the power that provided by non-organizational elements like suppliers and government (Bontis, 1998). Marketing channels and the information that have been provided via customer relationship creates the main theme of customer capital. Customer capital which is also being called as relationship capital by another definiton, is the total of all assets which creates and manages the relations of the organization with its environment. Customer capital includes all the relationship with shareholders, suppliers, competitors, government, official institutions and the community with customers (Bozbura & Toraman, 2004). In short, customer capital represents the relationship with its external stakeholders (Chu et al., 2006). Five basic criteria have been improved to evaluate customer capital. These are customer type, customer continuity, customer role, customer support and customer success (Chang & Tseng, 2005).

3. Intellectual Capital Management

Management refers to all activities of using owned sources to achieve the goals (Koçel, 2001). From this point of view, intellectual capital management means to effectively use any kind of sources on the way to achive organization goals and to check which consequences have been reached. If an organization analyzes how the investment on information technology effects personnels' creativity capacity and develops new evaluation methods to manage intellectual management and to determine the status of this investment in value creation process, then this means intellectual capital management exists in this organization (Petty & Guthrie, 2000). Intellectual capital management creates a competitive advantage and it is as important as evaluation, reporting and comparison of intellectual capital (Bradley, 1997). The important content of intellectual capital comes from heterogeneous resources like information. Information management is the core of intellectual capital management. The wide transfer of information into the organization, its sharing and its communication is so important on development of intellectual capital. Also at the same time, intellectual capital management is closely related to prevalence and expansion of information management (Ding and Li, 2010). Intellectual capital management is a wider concept than information management. The main goal of intellectual capital management is to increase the value of the organization by creating a competitive advantage. To manage intangible assets is to define these assets, to discover the connection between organization's present and future values and at the end to manage these activities efficiently. Information creation is another intangible asset that the organization manages. From this point of view, information management is a part of intangible assets management (Sanchez et al., 2000). Intellectual capital management start with the determination of the following subjects: Determination of mission and vision of the organization, analysis and opportunities and threats of environment, determination of competitive factors, analysis and opportunities and threats of organization, product and service portfolio and costs and differences against other organizations, technology adoption and development strategies, evaluation of organization's current performance (Sullivan, 2000).

Intellectual capital of an organization is the basic assets that increases organizations' performance. That's why, management of these assets' is one of the most important subjects about increasing the effectiveness of competitive process. Marr and other reserchers explained intellectual capital management process under a few topics. These are (Marr et al., 2003):

- To define basic intellectual capital variables that increases organization perforance,
- To determine the relationship between intellectual capital and value creation processes,

- To develop intellecxtual capital and information management,
- To evaluate the perfomance of intellectual capital circulation,
- To report intellectual capital performance in and out of the organization.

Intellectual Capital Management's Effects to Organization: With the increase of importance and strategic value of intellectual capital, measuring and reporting of intellectual capital became more actual. If organizations cannot provide and use strategic, operational and financial information in time, this will bring a high level of risk in modern economic approach. This is being commented as a threat to organizations. Today's measuring and reporting systems cannot determine and clarify the value of the intangible assets that organizations have (Şimşek & Kıngır, 2006). Organizations must provide some conditions to improve intellectual management system. First, organizations' managers must be aware of that organization performance cannot be expressed with only financial terms. All organization personnel must know what are the intangible assets that creates a value to the organization and understand the effects of these assets on organization's performance. The adoption of intellectual capital management requires most organizations change and correct their organization cultures (Belyolava, 2003). Intellectual capital causes some changes in management structures of the organizations' which are revealing and developing intellectual capital. Some of these changing subjects are organization cultures, supervisor characteristics and supervisors' management styles (Arıkboga, 2003).

Measuring Intellectual Capital: Intellectual capital's importance for organizations as a competitive element and its flexible and complex structure causes the measurement of this capital type as an obligation (Türk & Bengü, 2010). Intellectual capital became organizations' most important and valuable competitive power. That's why it is so important for organizations, to know what are the intellectual capital classifications and how to use these (Ross & Ross, 1997). Even if it is wrong to confuse intellectual capital measurement with financial data, it would be a bigger mistake not to perform this measurement. To manage intellectual capital is closely related to find new ways -which are related to financial datas- to monitor intellectual capital. The data that have been obtained from these results will allow organization managers to evaluate annual performence and to compare with other organizations about different criterias (Demirkol, 2006). The increase of the number of measuring tools of intellectual capital shows that the importance of intellectual capital concept is increasing. Because of this, there are different reasons to measure intellectual capital. Some of the basic reasons tomeasure intellectual capital are to create a management strategy, to affect human behavior and performing a comparison and reporting performance (Marr, 2004). For intellectual capital measurement, an effective system should have two types of performance keys. These are effectiveness and efficiency. Effectiveness measures intellectual capital in two different types. One of them is positive changes in intellectual captital; the other one is to determine how intellectual capital management effects organization performance. The measurement of efficiency of intellectual values is a complimental to performance measurement. It is the measurement of if the organization gets the maximum profit or not with intellectual capital inputs. Customer satisfaction and employees' efficiency are examples for these measurements (Gray, 2001).

4. Methods of Measuring Intellectual Capital

The interest in managing intangible assets is derived from the development of different methods of measuring intellectual capital. In last years, creation of models and methods about measuring intellectual capital is increasing (Montequin et al., 2006). The goal of measuring intellectual capital is to determine a price to intellectual capital as an intanbigle asset, to classify intellectual capital and monitoring the changes. Organizations have several measurement methods which are based on intellectual capital criterions. In this study, the methods that are being used measuring intellectual as a whole.

A) Market Value / Book Value Method: Intellectual capital's best-known indicator is the market value - book value method. According to this method; the difference between organization's market value and book value shows organization's intellectual capital (Stewart, 2000). In other words; the difference between an organization's market value and book value shows the value of organization's intangible assets, which is intellectual assets. However, this method contains some drawbacks like instability of share prices in stock market and affection of this instability by factors from outside the organization (Uzay & Savas, 2003). So we can say that, due to fluctuations of market prices and the adverse conditions arising from the use of evaluation methods which has different cost values arised from traditional accounting creates this method's drawbacks (Chan, 2009).

B) Tobin's Q Ratio Method: This method has been put forward by economist James Tobin. According to this method; a comparison must be done between an asset's market value and this asset's replacement cost. The exceeded part of asset's market value than asset's replacement value is called intellectual capital (Stewart, 2000). Tobin's Q method states the advantage of providing higher profits because of intellectual assets that the organizations have. This method is looks like market value/book value method. The difference is the usage of assets' "replacement value" instead of assets' book value. We can say that: "Q" is the ratio of organization's market value to assets' replacement cost (Güçlü, 2005).

C) Calculation of The Value of Intangible Assets Method: Evaluation of intagible assets can be explained in seven steps. These steps are (Stewart, 2000):

- First step; calculate organization's pre-tax profit average for last three years.
- Second step; calculate organization's tangible assets average from period-end balance sheets for last three years.
- Third step; calculate the ratio of three year pre-tax profit average to tangible assets' average.
- Fourth step; calculate average of organization's tangible assets' income ratio and if this ratio is higher than sector average, continue to process.
- Fifth step; multiply organization's income ratio average by tangible assets average. The result shows how much more profit provided by the organization against other organizations; so, it shows organization's additional income.
- Sixth step; calculate income tax rate average for three years and multiply by additional income and substract this amount from additional income. This result is after-tax amount.
- Seventh step; divide this calculated amount by capital cost rate. This amount that is not on the balance sheet is intangible assets value.

This method is more complicated and time taking according to other two methods but it also has positive features like performing a more realistic income comparison between same and different sectors.

5. Conclusion

While considering today's competition conditions, especially the rapid changes and developments in technology have led radical changes in our lives. By these changes, communication technologies advanced and sharing of information facilitated. According to this, to use and to be possessed of knowledge and information have become an important asset and value. Organizations realized that the most important resource of wealth that they have is the manpower and knowledge that this manpower have. And this has played a key role in uncovering intellectual capital. Organizations have always tried to develop more effective strategies to have an advantagous position against their competitors to move the organization to more advanced levels. During developing these strategies, organizations used human capital, structural capital and customer capital which are intellectual capital's basic elements. These strategies which lets to evaluate, approve, reward and use intellectual capital more effective and efficient have become a vital component of organizational success. Intellectual capital is a very important potential for organizations in providing a competitive advantage. This potential that intellectual capital has is making an obligation to manage this capital effectively.

Intellectual capital contains intangible assets besides tangible assets. However, the existence of intangible assets makes management and evaluation of intellectual capital more difficult. Successfully managing intellectual capital means to create, keep, organize, analyze, distribute and apply critical information to achive the desired results. Another important subject is how to manage intellectual capital and which critical elements should the organization have for a successful management. An organization whcih manages intellectual capital should give most importance to human resource. Besides this, organizations should use the synergy that they create in human, strucure and customer capital effectively. In order to accomplish these, organizations should accurately determine the gaps between the ınformation that they already know and they should know, and close these gaps by developing an effective stategy.

Intellectual values that the organizations specified contains intangible assets; because of this, calculation of intellectual capital is not easy. When we review the literature, we can see that there are several methods that have been developed at organizational and elemental level to calculate intellectual capital. This study includes the methods that are being used at organizational level to calculate intellectual capital. These are: Market Value / Book Value Method, Tobin's Q Ratio Method and Calculation of The Value of Intangible Assets Method. Market Value / Book Value Method and Tobin's Q Ratio Method have similar features. Because in both of these two methods, the difference between organization's market value and

book value is being put forward. However, Tobin's Q method is separating from the other method by using assets' replacement cost instead of book value to calculate intellectual capital. The most important point while using these methods is, all used data such as market value and book value should have been formed in capital market.

As a result, the purpose of creation of financial tables in organizations is to fully satisfy the information requirements of organizations' personnel, suppliers, customers etc. These methods have some drawbacks. However, the calculation of intellectual values and presentation of it with financial tables is an obligation. In the future, the development of intellectual capital can be monitored by theoretic and different methods. By this way, the important existence of intellectual capital will be monitored in knowledge-based economies of changing and evolving world order.

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