The Impact of Intellectual Capital on the Performance of Companies

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Abstract

Nowadays, particularly in the competitive technical world, knowledge as the most important capital has replaced financial capitals, giving the concept of intellectual capital a new vast function as a result. Intellectual capital reflects in the processes, information, brand and human resources of the organization and it is playing an increasing role in the creation of lasting competitive advantages. This study has analyzed the association of intellectual capital and the performance of hyper company.

In a company, the intellectual capitals are the belongings which increase in value when shared with others and as the time go by. The companies are the most important centers for providing services and the management of invisible possessions is very significant. In order to avoid spoiling of the efforts an costs: first, the importance level of each of the aspects of intellectual capital most be recognized then, actions must be taken in their management and development.

Keywords: Intellectual capital, financial performance, human capital, structural capital, physical capital.

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Introduction

Most of the current accounting systems are not aware of the increasing role of virtual possession right and they are unable to measure the real value of belongings in their calculations. In other words, the financial records are facing many restrictions in the explanation of real value of companies. The efficiency of employed intellectual capital has become more important than the efficiency of employed financial capital In our knowledge centered world (Harisson , 2000) . This means in comparison to the intellectual capital , the significance and the role of financial capitals in determining permanent profitability will decrease substantially in the future. This has caused a gap between the real value of the companies and organization and the calculations of traditional accounting.

The main point of this study is the analysis of the role and significance of intellectual capital in the real value of the corporations and their financial performance; one which is very important in success or failure of the companies. On the other hand , due to the attention and tendency towards the intellectual capital in the imminent companies , this study also strives to emphasize its value this concept in our country.

Statement of the issue

The world has entered a new phase and the production based economy has been replaced by knowledge –based economy. In the new economy , intellectual capital has become the most important source of competitive advantage. In the knowledge based economy , production and use of knowledge plays the major role in the wealth production process. The concept of intellectual capital is one of the pillars of knowledge management . The intellectual capitals of the organization are the ones which increase in value as they are shared or as time goes by. Thus , the recognition and management of intellectual capital is very important for an organization (Hang , 2002) . The concept of intellectual capital was first proposed by Feiwal in 1969 . He believes that intellectual capital includes not only the knowledge anexpertise, but also the ability to implement them for value production (Feiwal , 1975). Later , thinkers proposed other definitions in this field. Some of them are as follows :

Intellectual capitals includes any sort of knowledge in the company such as the skill and expertise of the staff, the relationships with the costumers and providers and the knowledge that can turn into profit (Kalson , 2003). Intellectual capital equals competence multiplied by commitment (Alrich, 1998) . intellectual capital is a kind of knowledge with the ability of turning into knowledge or it’s the organizational knowledge itself (Deniz , 2006). Intellectual capital is a part of knowledge management and in an organization it equals the sum of the knowledge of the staff (Ross, 1998).

Different researches have been carried out regarding the identification of basic aspects and characteristics of intellectual capital. In most of these studies intellectual capital is divided into 3 major categories : human capitals, structural capitals and relational capitals (Golerden , 1999). Bontis divides intellectual capitals into 3 categories : human capital, structural capital and costumer capital(Bontis , 2001) . In another model , presented in 2006 , 4 indicators have been identified as the as the determiners of the intellectual capital of organization (Hang, 2006). Some of the definitions for these aspects are as follows :

Human capital is the available knowledge of each one of the workers of the organization(Bontis , 2000) and it’s the basic element in realization intellectual capital (Ross , 1998). Costumer capital is the knowledge employed in marketing channels of the organization and the relationship with the costumer while doing the business (Bontis ,

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2000) . Innovation capital includes a part the part of innovation power of the companies which is in terms of intellectual capital and consists of reserved business rights, secrets of the business and the guidelines of knowledge (Jafari , 2006) . Process capital consists of both value increasing and non – value increasing processes including systems, procedures and approaches (Jafari , 2006) .

This study Hung's model, which has divided intellectual capital into six indicators: human capital, costumer capital, innovation capital, financial capital and information technology (2).

This research aims to analyze the importance level of each one of these aspects in the performance of the company, and also determine the influential factors in each aspect of the intellectual capital.

The necessity for this study

The widening gap between the real value and the book value of the companies has gained attention of the researchers for giving an explanation of the invisible value excluded from among the financial records. The value which we refer to as intellectual capital is present in all of the aspects of the organization as a body of knowledge but it is ignored. According to a research carried out in some Taiwanese companies, the ratio of the real value of the companies to their book value is has increase gradually from 1 to more than five times from 1997 to 2001. The studies show that almost 80 percent of the market value of the companies has not been reflected in their financial reports (Feiwal , 2000). The importance and necessity of this study is due to the increasing role of once ignored concept of intellectual capital in the real value of the companies and their financial performance, and the resulting success and failure in the competitive and complicated atmosphere of this era.

Review of literature

The term "intellectual capital" was first used by John ContKalbris. In his definition "intellectual action" is something beyond thinking as "mere thought". The implementation of this view means that intellectual capital may be more dynamic than the fixed form of the capital (Garden , 1999).

Many studies have been carried out regarding the discussion of intellectual capital and its association with the performance of the companies. One of these studies is the one conducted by Bontis in Malaysia which aimed at analyzing the three parts of the intellectual capital, i.e. costumer capital, structural capital and human capital in service and non-service sections. This analysis shows that structural capital is more influential in both industries. Although the impact of human capital has also been important in both industries, but it has affected non-service companies more than service providing ones .

Palick has made use of a model called "intellectual increased value coefficient" by which he has measured the performance of Australian banks from 1993 through 1995 , and Croatian banks from 1996 through 2000. The results of both of these studies shows a substantial difference in the rankings of financial institutions according to the measures of traditional accounting compared to the efficiency-based accounting. Using the same model ,Maveridis studied the performance of Japanese banks in 2000. His study too, indicates a substantial difference in the performance of intellectual capital among different groups of Japanese banks (Bontis, 2000).

Firer and Williams studied the association of the performance of intellectual capital and clarity of the performance of the companies, but their study didn’t detect a significant correlation between the two. However, in

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higher levels of intellectual capital it seemed like there has been a substantial decrease in the clarity of the intellectual capital (Garden, 2000).

Barney believes that since the time intellectual capital was recognized as invisible in nature, it gradually has come to be noticed extensively by the imminent companies as a strategic possession creating lasting competitive advantages and efficient financial performance (Calson , 2003).

Edwinson and Mallon too, have defined the gap between market value and book value in terms of intellectual capital.According to Bontis , in broad terms , intellectual capital includes human capital and structural capital (Alrig,1995) . In yet another paper , he claims that human capital includes a set of the features of the staff such as competence, commitment, motivation and faithfulness. Although the human capital is considered the main element of intellectual capital, one of its features is that it is goes away as the staff go out (Harrison, 2000).

Tan et.al (2007) analyzes the association of intellectual capital and financial performance of 150 companies from the stock market of Singapore from 2000 to 2002. The results of this study were remarkable in different regards. One of these is the positive regression of intellectual capital and financial performance of them. Furthermore, the intellectual capital and the future performance of the companies and the growth rate of the intellectual capital correlated with the performance of the companies. On the other hand, the share of intellectual capital in the performance of the companies was regardless of industry (Ebrahimi , 2009).

Donaldson and Preston introduced structural capital on the other side. Structural capital belongs to the whole of organization and includes innovation capital, relationships capital, and organizational hard core and so on. The calculation of the value of intellectual capital aligns with the shareholders' view theory which believes that the relationships among gainers include all types of relationships of the company with shareholders, staff, costumers, providers and the representatives of the unions (Ross , 1998).

Two researcher , named Lu and Radhakeishnan developed the assessment measures of human capital by modeling the sale of the company as a function of the human capital of the company , net fixed possessions , the number of staff and the capital of research and development. By going through 250 companies , they showed that the human capital will estimate the market value, growth, and the potential status of the company , regardless of human capital (Bontis ,2001).

In order to cover the weaknesses of the assessment approaches of intellectual capitals and invisible belongings,Rudof and Liliart (2002) presented new financial approaches known as FIMIAN (Bulon, 2009).

Chen et.al studied the association of intellectual capital market value and the financial performance of Taiwanese stock market companies from 1992 through 2002. The results of this study showed the positive effect of intellectual capital on the financial performance and the market valaue of these companies. This study also indicated that the intellectual capital as an indicator of the financial performance of the companies in the future (Deniz,2006).

Anvari and Rostamitoo , having measured intellectual capital in 5 different ways , studied it's correlation with the market value of stock companies. In 3 of these ways, a significant positiveregression between these two variables has been approved (Hang,2004).

A study carried out by Madhushi and AsgharnejadAmiri too has analyzed the intellectual capital and its association with financial efficiency of the companies in the

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investing stock companies of in Iran. The results of this study indicates a correlation between intellectual capital, financial efficiency and the future financial performance of these companies(Feiwal , 2000).

Measurement of intellectual capital

Many measurement systems have been devised recently in order to measure the intellectual capital but still there is no common method for this measurement. Despite the numerous current efforts for qualitative and at times ,quantitative measurement of invisible belongings ,there is no common perfect system considering all of the aspects of the measurement. In this section , the evolution and different measurement methods of intellectual capital have been discussed comparatively (Hang,2006).

The classification presented in the above table has been proposed by Rudof and Liliart and has analyzed the qualitative and quantitative methods of identification and measurement of intellectual capital from 3 perspectives: qualitative or quantitative method of measurement, attitude towards the future or the past and the ease of using other methods.

Nowadays, everybody knows that the Internet and worldwide web is the harbinger of a new era known as knowledge era and bidding farewell to the industrial era. In the industrial era beginning in 1890 mass production and consumption was emphasized. But in the knowledge era knowledge is what leads human beings to success. This invisible possession is known as the intellectual capital and the development of intellectual capital is the vital area of profit making (Mojtahedzade , 2003 p.7) . Knowledge-based business atmosphere requires an attitude including new invisible organizational belongings such as knowledge and organizational competence, innovation, relationship with the costumers, organizational culture, systems, organizational structure and so on. Among all of these points , the theory on intellectual capital has gained the increasing attention of academic researchers and organizational workers (Gelich li et.al , 2006, 126).

In 1982 , from each 100 dollars invested in the stock of producing companies in the US, 62% was spent on visible belongings and these possession claimed a remarkable share of the companies' market value. But in 1999, it reached 16 % i.e almost 84% of the market value of the companies was related to intellectual capital.This increase in the ratio of invisible belongings to the total market value shows the significance of paying attention to the intellectual capital. Figure 1 indicates this development (Chang et.al 2008, 640) . In the explanation of the issue it is to say that the result of the studies has indicated that the companies with a higher level of mastery and concentration over invisible possessions have better performance, better capital return, compared to the companies which ignore the role of these belongings specifically the intellectual capital and less stock value fluctuation (Bramhandkar, 2007).

This significance is revealed even more when a company is sold to a price 4,5 times it's belongings. The extra fee paid is the price of intellectual capitals such as human capital, structural capital, communication, brand and so on. While in most of the cases these precious belongings have no place in the formal records of the companies and raises some problems in determining the price of the companies and the assessment the capital of the companies.

Figure 1 : the development of the intellectual capital percentage in the market value of the companies (Chang et.al ,2008, 640)

Market value (%)

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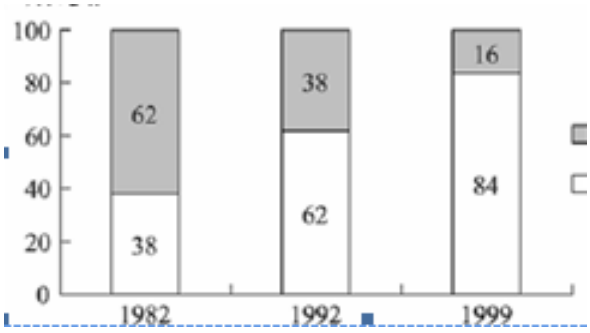

gray: visible belongings , white : intellectual capital

The important point is that we lack a measurement system making us able to focus on people as much as we focus on the physical matters. Some of the international companies, experts and advisors have initiated analyisis of different methods for identification, measurement and reporting the intellectual capital in the organizations. During this procedure, new generations of internal and external accounting reports have emerged inside the organizations. The results obtained from reporting of the intellectual capital includes the improvement of the staff morale ,less replacement of the staff, increase in the investment in the development of the intellectual capital, valuing the intellectual capital of the company by employing staff of higher order compared to the past and having a better understanding of the main elements necessary for permanent growth and development (Zanjirdar et.al , 2008b , 14).

History of the development of the concept and use of intellectual capital

John kalprit was the first person to use the term intellectual capital in 1969. But in the middle of 1980's the movement from industraial age to information age began and a wide gap was noticed between the market value and the book value of the companies. In late 80's , the first efforts took place for codification of the financial records measuring intellectual capital and some books were devised regarding this topic such as the management of knowledge belongings devised by Amiden. In the early 1990's ,the issue of management of intellectual capital was renown in the organization by allocation of an official position and Mr.Edvinson was introduced as the manager of the intellectual capitals in the Scandia company and the concept of the attitude of balanced evaluation was introduced by Kaplan and Norton some papers were published in Fortune magazine. But in the middle of 1990's SEC held the first symposium regarding intellectual capital. In the early 2000's the first credited journal focusing on intellectual capital was published and the first standards of accounting intellectual capital was published by Danish government. Nowadays, various projects , such as publication of books ,holding seminars and working on a number of projects are carried out in this field.

Elements and definitions of intellectual capital

Concluding different definitions of intellectual capital and it's elements we can divide intellectual capital into 3 categories : human capital , structural capital (organizational) and costumer capital (Zahedi et.al, 2006, 44) .

Human capital is the most important possession of an organization an the source creativity and innovation. In an organization, implied knowledge possessions of the staff is one the vital elements playing a significant role in the performance of the companies (Zahedi et.al, 2007). The human capital is also an amalgamation of knowledge, skill, innovation power and the ability of company staff in doing their tasks and it includes the values, culture and philosophy of the company. Edwinson and Malon define structural capital as the hardware , software , data base , organizational structure, exclusive rights of the organization, business signs and the sum of abilities of the organization supporting the efficiency of the staff. Structural capital means what is left in the company after the staff leave the workplace in the evening. Structural capital is divided into

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some categories : culture of the company, organizational structure, operational process and information system (Zahedi et.al , 2007, 48).

Costumer capital , considered as the bridge and the catalyst in the activities of the intellectual capital, is one of the main requirements and determiners in turning intellectual capital to market value an as a result , in the business performance of the company. Costumer capital is considered a major and basic part in of the intellectual capital placing the value in the marketing and connection channels of the company with the leaders of that industry or business (Zahediet.al , 2007, 46).

Successful management of the intellectual capital

In order to bring a positive change in the future value of the agency , it is necessary to have a better understanding of the intellectual capital and the latest tools for recognition, measurement, and management of this important point in the value creation.

Implications of accounting management introduced by the American official accountants association define five major steps in the successful management of the intellectual capital :

1 . Identification of the intellectual capital of the agency

2 .Drawing the important factors of value

3 .Measurement of the intellectual capital

4. Management of the intellectual capital

5 .Reporting the intellectual capital

The first step is the identification of the intellectual capitals of the agency. This step consists of the measurement of its value. All of the intellectual capitals are not of the same value for an agency. These capitals become valuable when they contribute to the progress of the aims of the company. Once the intellectual capital is identified, its value can be measured. While valuing intellectual capital you most keep in mind that the value of the intellectual capital depends on the strategy of the agency and interacts with others sources dynamically and depends on them.

The next step is drawing the map of value creation. This interesting analogy has to primary function: making sure that this strategy is interconnected and consistent with all of the value factors of the intellectual capital , and providing the possibility of connecting the strategy easily with the role and significance of the intellectual capital in the progress of the strategy.

After the identification and drawing the value elements of the intellectual capital, the agency can start their measurement. There are lots of tools and techniques for measuring intellectual capital.

Once the intellectual capital is measured, it can be managed. We can find out the current level of function by asset of the relevant evaluations and find out whether the intellectual capital has improved or declined ,getting to know which activities or programs have influenced the performance. We can use this information in decision making, analysis and testing the strategy and management of the dangers related to the intellectual capital.

The last step is reporting the intellectual capital, the goal of which is to give information about the intellectual capital of the organization to it's gainers. There are different ways for considering the restrictions of traditional financial reporting in revealing information about intellectual capital, still there is no agreement on any standard. Consequently, various organizations have provided various voluntary reports , getting to know it's various advantages such as improving the recognition of gainers of the strategies of the agency and

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improving the image and reputation of the agency.

The reason for measuring the intellectual capital by the companies

There are different reasons for which the companies are willing to measure the intellectual capital. In a study the following reasons have been listed :

1 . Measuring intellectual capital can contribute to the codification of business strategies for an organization.

2 . The organization can gain a competitive advantage by identification and development of its intellectual capital.

3 .Creating key indicators of performance,which helps with the evaluation of strategy administration?

4 .Using non-financial evaluation of the intellectual capital can be connected to the pay back and bonus payments of the company.

5 . The interaction with foreign shareholders, controlling the intellectual belongings of the company (Helman , 2005).

The reason 1 through 4 is for inter-organizational goals and 5 is for intra-organizational goals.

Daniel Anderson introduces these reasons for the measurement of the intellectual capital by the companies : improving internal management, improving external reports, the gratitude of executive and legal proponents .

Finally, we can say there are two major missions for the knowledge management :

1 . There is constant effort for better expansion and development of the systems, for creation, recording and spread of knowledge within the organizations.

2 . There is increasing information suggesting that knowledge increases the value of business remarkably, and is some cases this knowledge shows almost the whole hard core of the value.

Because of this, it's necessary that the discussion of intellectual capital should move towards the creation of new criteria able to record and report the value resulting from the intellectual capital. Thus , the time has come for the intellectual capital to be included accounting financial reports of the organizations (Zanjirdar , 2008, 11) .

Measurement methods of the intellectual capital

As discussed earlier, the traditional accounting ignores some values such as experience, skillfulness , reputation of the shareholders or the owners, causing a gap between market value and the book value of the business units. Here ,we will discuss 14 model of the 30 model devised fo the measurement of the intellectual capital and do away with this wide gap or at least decrease it :

1. Kiwi –Tobin

This method was developed by noble prize winner James Tobin (1978). This ratio measure the relationship between the market value of a company and it's replacement value(the replacement cost of the belongings of that company) . Theoretically, in long termthis ratio move towards unity but the experiential observations indicate that in some cases this ratio can be different from 1 in a significant way. For example the software companies making abundant use of the intellectual capital have a ratio of 7 or higher while the companies with high physical capital have a ration near 1. Kiwi –Tobin ration is originally very much like the ratio of market to the record , but it is different in the sense that while calculation, Tobin uses the replacement cost of physical belongings instead of the recorded cost of the physical belongings.

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The resulting ratio is implemented this way : If the kiwi ratio of a company is more than unity and more than competitive kiwi the company can gain more profit comparing to the similar companies.

2 .Human resources accounting

Human recourses accounting is one of the methods, dating back to 60's and 70's .This approach is similar in some senses to the concept of intellectual capital and it's measurement. Human recourses accounting is one of the pioneering actions in the field of intellectual capital including some calculation approaches of the human recourses value. But it seems like these approaches have no effect on the performance of the company whatsoever and this is considered one of it's liabilities. According to the definition provided by Flim Holtz(1985) , human recourses accounting includes the measurement of the costs of the business units and the organizations while developing and training for the human possessions such as recruitment and employment of the staff. It also includes the measurement of the economic value of the people for the organizations.

3 .Invisible balance sheet

Invisible balance sheet , considered one of the pioneering approaches in the field of invisible , was developed by Sweeby in Sweden .Back then, Sweeby reacted against the shortcomings of the traditional accounting systems in valuing technical knowledge and developed a framework for reporting invisible belongings , which later came to be known as the invisible balance sheet. The aim of the book published under this title was showing a practical way in order to report on the human recourses , the most important source and the first generator of the technical knowledge. 35 non-financial indicators were suggested in order to complete financial report with information relevant to the staff such as lasting, knowledge, ability, effectiveness and income creation potential. In the invisible balance sheet , the difference between market value and the and net book value was calculated by 3 interconnected levels of capitals called human capital, structural capital (organizational) and costumer capital. These 3 levels of capitals were first published in this book and turned into an unofficial standard in the future (Jafari et.al 2006).

4 .Balanced evaluation card

This method, developed by Kaplan and Norton (1992) , is trying to balance long –term and short- termgoals , financial and non-financial measures, pioneering and following indicators and the internal –external aspects of the organization. Generally , the 4 perspectives of costumer , finance, internal processes and also the learning and growth are implemented in turning high levels of strategies into real measures and with each perspective , the goals , indicators, criteria and the required basics are listed. The interconnection of these 4 aspects must be taken into account. Comparing to the measures of traditional accounting, balanced evaluation card has shifted the center of attention from financial indicators so that it include thekey measures of invisible success. These are almost equal to the three key measures of the intellectual capital including human capital (knowledge and experience of the staff) , structural capital (the knowledge hidden in the systems and processes of the organization and customer capital (costumer connections). According to this the mentioned aspects can be matched appropriately in order to evaluate the current conditions of knowledge management and its evaluation.

5 .Direct intellectual capital

This approach of the intellectual capital places the emphasis on the identification of the different elements and then on the evaluation of each one these elements. By determining the elements of the intellectual capital (such as costumer capital for example the faithfulness of the costumers , intellectual ownership such as

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the right of innovations, technical belongings such as technical knowledge , human belongings such as training and structural belongings such as information systems) and determining the value of each one the elements the total value of the company's intellectual capital can be calculated. This is the most complicated , and at the same time the most accurate tool for the measurement of the intellectual capital. The major flaw of this approach is the requiring identification of lots of elements and their measurement and or valuing which makes it complicated and expensive (AnvariRostamiet.al , 2002 , 62).

6. Scandia orientation

Scandia is a Sweden financial service company which is renowned for it's pioneering in the measurement of the knowledge. Scandia developed it's intellectual capital report internally in 1994 , as the first eminent company to give a report of it's intellectual capital to the shareholders as an appendices of financial reports. Scandia used a wide range of methods and tools and eventually, presented it's developed it's specific measurement tool under the title of Scandia orientation, accompanying the relevant value creation model.Edwinson as the chief architect of these innovative topics in the Scandia company devised a dynamic and comprehensive model for the reporting of intellectual capital called Scandia orientation and consisting of 5 fields ; financial, costumer, process,development and renovation and human (Edwinson , 1997).

7. Accounting and cost finding of human recourses

This method developed by Joe Hanson, calculates the costs related to the hidden effects of the human recoursesdecreasing the venue of the company. The intellectual capital is measure through the calculation of the amount of human belongings participation divided by the the cost of invested salaries. Grojer and Johnson emphasize that accounting and cost finding are accompanied by vast domain of uses :

As political tool in order to show the planning deficienct and and then in the discussion of more investment or better management.

As education tool for the analysis of the structuring and thus having a better understanding, solving the problems of the staff from a practical perspective, thus having a better ability in order to balance the practical values against other values

As supportive of the decision making in order to make sure that they are more rational regarding the staff from a technical perspective (Jafariet.al ,2006) .

8. Technology agent

Technology agent model was devised by Brooking (1996) . He devided the organizational knowledge into 4 levels, namely human centered possessions, infrastructural possessions, intellectual possessions and market possessions and determine the value of the intellectual capital of the company in the evaluation process. Each part of the model is analyzed by the special discrimination questionnaires on the variables related to the level of the possession .the first part of the questionnaire includes 20 questions emphasizing the need for the fortification of the intellectual capital followed by a78 questions related to the 4 levels mentioned from the intellectual capital.

9 .Controlling the invisible possessions

This method developed by Sweiby , defines 3 types of invisible possessions resulting from the gap between the market value and the book value of the companies. These 3 parts of the invisible possessions include external structure(business brand, costumer communications and the provider) , internal structure (management, law , by-law , the approach and behavior,

(DOI: dx.doi.org/14.9831/1444-8939.2015/3-2/MAGNT.184)

software) and individual competence (education, experience and expertise) . There are 3 indicators focusing on the development and remaking , efficiency and lasting of the part. When the Scandia orientation model comes to contact with themangement culture and philosophy of the organization, invisible possessions controlling classifies them under the internal structure. Due to the specific emphasis of this model on human being, this model is based on the assumption that human being is the single element in business and other structural aspects including internal and external are hidden in the human activities.

10. Economical increased value

Economical increased value as one of the functional measures based on value, gained excellent popularity upon emerging. This method is relatively one of the new methods of the evaluation of the organizational performance developed by Stewart and New York counseling company. This method focuses on maximizing the wealth of the shareholders. Economic increased value is the is the cash flow (after tax subtraction) by the company minus the mere capital cost spent on creating that cash flow , thus it indicates the real venue compared to the book value. Economic increased value ,as the difference between the net sale and the sum of operational costs, taxes and the costs of the capital while capital costs is calculated through multiplying average cost of balanced capital in the whole capital (invested). In practice , the economic increased value increases when the balanced mean of capital cost is less than the return of net capitals or vice versa . Right now, the economical increased value approach has been established well and increasingly the eminent companies are adopting it as the base of business planning. In other words , the change in the economical increased value provides a criterion in a way that whether the intellectual capital of the company have been effective or not. It is evident that this way, the economical increased value is a replacement for the intellectual capital and doesn’t provide accurate information regarding the effect of the intellectual capital on the performance of the companies.

(DOI: dx.doi.org/14.9831/1444-8939.2015/3-2/MAGNT.184)

11 .Market value to the book valueIt is one of the general methods identified in order to measure the invisible possessions and the intellectual capital. This value is calculated through the gap between the market value and the book value. Despite it's simplicity, this method has problems in the measurement and interpretation of the results. Book value depends on the national or international standards provided according to those accounts which might change the book value in practice. On the other hand the stock value in the market is fluctuating all the time, making the results valid only for a short time. Does that mean the value of the invisible possessions is subject to change all the time?

Can a deal or a change in the market cause the invisible belongings emerge and disappear so easily? The market value to the book value gives an unreliable amount of the invisible possessions. However we can use this ratio appropriately in some cases; for example when we want to measure the intellectual capital of a company in comparison to the other rivals in the industry

12 .Calculated invisible value

This model is based on the assumption that surplus income of a company for example the surplus income to the average income in the industry, originates from it's intellectual capital. In other words , the income of a company approaches the average income of that industry maximally , by implementing physical possessions , and only by implementing intellectual capital capital can a company gain surplus income. The data required in this method are obtained from the balance sheets of the company. The implementation of this method can be divided into six steps :

Calculate the average income of the three years of the company before subtracting the tax (a).

Calculate the average physical possessions of the year end of the company (b)

Divide the income to the physical possessions to obtain the return rate of the physical

possessions ($\boldsymbol{c} = \frac{\boldsymbol{a}}{\boldsymbol{b}}$).

Calculate the average rate of return divided by the physical possessions for the industry (d) in the past 3 years and continue the steps if it is less than the average return rate of the company. Then , calculate the ratio of average taxes divided by income in the past 3 years (e).

Calculate the surplus return using $f = [(a - b) \times (b)] \times (1 - a)$

Finally, divide the surplus return (f) to an appropriate percentage , for example the capital cost of the company.

13 .Value explorer

Value explorer is an accounting method suggested by KPMG in order to calculate and allocate value to 5 category of invisible belongings. These categories are as follows : possessions and gifts , skills and the implied knowledge, social norms and values, visible knowledge and technology, main and management processes . These methods provide an insight into the future potential of the belongings of the company by looking into the cases such as increased value for the costumers, competitiveness, potential of taking new opportunities, tolerance and the strength. The goals of this method according to KPMG are as follows : Eelping other organizations in order to understand and measure the competitive advantages or the invisible belongings which have a strategic significance

evaluation of the relative strength and weakness of the invisible belongings regarding the future

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allocation of the income flow of the company throughout the competitive advantages (Jafari et.al 1385).

14 . Score results of the value chain

Score results of the value chain ,developed by lu , is a method for the measurement of the invisible belongings ,which is still in the development phase. The value chain begins with the discovery of the products, services and the processes , moving on towards the feasibility of technology and eventually, the marketing phase of the product of service begins. Value chain scoring card is matrix of non-financial indicators gathered in three levels commensurate with the development cycle: discovery and learning, execution, commercialization .

Calculation formulas and qualitative methods for the calculation of the value of the intellectual capital

In order to answer the question, how can we calculate the intellectual capital in terms of money, there are for formulas. The results of the statistical tests show that for the degree of certainty equal to 95%, formulas number 3 and 4 showed a statistical significance and high correlation (R amounts higher than 95%) with the stock value of the companies and industries of Tehran stock market. Thus, using these types of approaches can be advised strongly to the companies of Tehran stock market (AnvariRostami et.al 2005).

$$1)\ IC_1 = \frac{R_C - R_I}{WACC} \qquad 2)\ IC_2 = (\mu_C - \mu_I) \times TA$$

$$3) IC_3 = \sum_{t=1}^{T} \left(\frac{(MV_t) - (BV_t)}{(1 + I_{nft})}\right) \Rightarrow 4) IC_4 = \left(\frac{(MV_\mu) - (BV_\mu)}{(1 + I_{nf\mu})}\right)$$

Classification of the methods of measuring the intellectual capital

In a general classification, the measurement methods of the intellectual capital are divided into 4 general categories.

The first category: direct methods of the intellectual capital

These methods predict the monetary amount of the intellectual capital by different elements of such possessions. Among the mentioned methods the Technology agent method, accounting and cost finding of the human recourses, value explorer, direct intellectual capital and accounting of human recourses belong to this category.

The second category: market investment methods

These methods are based on the difference between market value and the capital in the hands of its shareholders, and considering the difference as the invisible possessions or the intellectual capital. From among the 14 methods, invisible balance sheet method, the ratio of the booked value, and the Kiwi Tobin belong to this category.

The third category: the methods of return on the possessions

These methods calculate the average income before the subtraction of the taxes and divide it to the average value of the physical possessions in a certain period and divide it to the average value of the physical possessions in the same

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period.TheEconomical increased value method and the calculated invisible possessions have these features and belong with these categories.

The fourth category: the Score points methods

In these methods, the different elements of the invisible possessions or the intellectual capital are identified and the provided indicators are reported for them or shown in the diagrams. The methods such as the balanced evaluation card, Scandia orientation, the invisible possessions control and the score results of the value chain belong to this category.

Suggestions

1 .Since in the new economy intellectual possessions are considered a competitive advantage for the company,we suggest that the managers aim to measure and promote these capitals by the analysis of their knowledge and intellectual capitals.

2 .One of the advantages of the adoption and implementation of information technology, one of the intellectual capitals is having an electronic system at disposal. The spread of a culture of using these capitals is must.

3 . In order to measure the intellectual capital the evaluation card methods such as the dynamic evaluation of the intellectual capital and balanced evaluation are used.

4 . The impact of the intellectual capital on the financial performance is analyzed through the use of market-based performance criteria such as Tobin, stock return and income growth.

5 .The relationship between intellectual capital and non-financial performance such as the costumers and staff gratitude.

Conclusion

The attention and emphasis on the intellectual capital must be taken into account in the organizations and its effective role in the general performance of the companies and the value creation process in the organizations must be appreciated as an effective element in improving the financial performance of the companies. Since in the research model human capital plays a major role in the calculation of the intellectual capital as a key element, providing a competitive atmosphere in order to determine the salaries and wages of the staff increases the efficiency of the research model to a great extent.

An important point about the elements of the intellectual capital research model is the significant correlation of the human capital and the performance indicators. This shows the important effect of the human capital on the financial performance of the analyzed companies. In other words, the key role of the human capital in the intellectual capital and in the financial performance as a result.

Intellectual capitals are the invisible belongings which cause the value creation for the commercial units, and they are one of the main points in the creation of competitive advantages in the companies in such a way that Edwinson has replaced the Adam Smith's famous metaphor, the invisible hand with "the invisible brain" , but they have no role in the balance sheets and other financial records. Considering the value of these possessions, their measurement, identification and control can find out the major flaw of the current accounting i.e. lack of the reporting and reflection of the intellectual capital and bring a great revolution in the management systems of the companies. Considering these facts, various formation elements and definitions of the intellectual capital and the reasons for their measurement were discussed in this paper.

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