Intellectual Capital and Knowledge Assets for Value Creation

H Haghshenas [1,*], G Barzegar [2]

[1] M.A. Islamic Azad University, South-Tehran Branch.
[2] Faculty Member at University of Mazandaran.

ABSTRACT

In knowledge-based economy, the intellectual capital is used for value creation in the organization, and in today's world, the success of any organization depends on its ability to manage these assets. In the ultra-competitive era, organizations are facing an environment characterized by increasing complexity, mobility and globalization. Therefore, to sustain, organizations are facing new challenges and releasing these challenges requires paying more attention to development and nurturing the inner skills and abilities. This is done through the basics of intellectual capital and knowledge assets which are used by organizations to reach a better performance in the business world. Knowledge and intellectual capital are recognized as a sustainable strategy to achieve and maintain the competitive advantage of organizations. Nowadays, because of the increasing importance of knowledge and intellectual capital in corporates sustainability and the unmatched role they play in maintaining the competitive position, several studies have addressed the intellectual capital and its components from different aspects. This study first specifies the history and the definition and components of intellectual capital, and then features of all components are discussed. In addition, the importance aspects of intellectual capital, the measurement objectives, as well as methods used for classification of intellectual capital measuring are also discussed and analyzed.

Key Words

intellectual capital, knowledge assets, knowledge-based economy, value creation.

Correspondence to:

H Haghshenas
M.A. Islamic Azad University,
South-Tehran Branch.

Introduction

By the end of the last century, science was considered same as the information available for public, and management roles were considered finding a way to optimally combine the products and markets, as well as removing barriers for entrance of substitute products and technologies. However, in recent years, the nature of resources has changed and is now competitive. To identify the true and sustainable sources of organizations, it is therefore essential to take the inside of companies into serious consideration (***Hajiha, 2010***). Today is the era of knowledge. The emergence of the new economy based on knowledge and information has led to increased interest of researchers in the field of intellectual capital. This field that has attracted the attention of many researchers uses the intellectual capital as a tool to evaluate the value of companies (***Piotang et al., 2007***). In today's knowledge-based societies, the role and the importance of the used intellectual capital in the sustainable profitability of corporates is higher that the output of the used financial investment (***Rostami and Seraji, 2005***). Intellectual capital is a multidisciplinary concept and is different in the fields related to business and commerce (***Huang and Luther 2007***). There is little agreement on the level of our understanding about intellectual capital. Intellectual capital, however, was unknown in the past, now it plays an important role in the process of economic, managerial, technological, and social development in various forms. The resulting revolution in information technology, the growing importance of knowledge and knowledge-based economy, the changing patterns of a network society as well as the emergence of innovation, as the most important determinants of competitive advantage, are those that enhance the importance of intellectual capital in companies more than before (***Anvari and Rostami, 2005***).

Intellectual property is the most important part in the corporate knowledge and is required to be identified and measured. Assets are very effective on determining a company's position in the international arena and determining the value of the company. Intangible assets of each company include corporate branding, corporate loyal customers, satisfied employees, creative employees, flexible and dynamic organizational culture, efficient and competent managers, a risk-tolerant environment, a good impression of the company to the customers. For example, the value of Coca-Cola's brand is several times more than the value of the total asset of the company. This group of assets plays an important role in providing a long-term competitive advantage for companies. The companies that are able to recognize their assets properly and manage them well, they will have a better performance than their competitors. In other words, the proper management of these assets play a critical role in the success of companies which work in today's competitive world. Intellectual capital is a topic that deals with the management and administration of these assets.

History and definitions of intellectual capital

The term "intellectual capital" was first introduced by ***John Kenneth Galbraith*** (***1969***). Galbraith believed that intellectual capital is an ideological process and consists of intellectual process. Before identifying, managing and measuring the intellectual capital, we need to understand the concept it has. The concept of intellectual capital has always been ambiguous, and different definitions have been used for the interpretation of this concept. Many tend to use terms like assets, resources or operation incentives rather than "capital", and replace the term "intellectual" by words like intangible, knowledgebased or non-financial. Some professions (finance accounting, and legal professions) have also proposed different definitions such as "non-financial fixed assets" which has no objective and physical entities. According to what was discussed, there are different definitions for intellectual capital some of which are mentioned at the following:

1. Stewart believes that intellectual capital is a set of organizational knowledge, information, intellectual property, experience, competence and learning that can be used to create wealth. In fact, the intellectual capital includes all employees, organizational knowledge and skills for creating the added value and lead to sustained competitive advantage.
2. Bentis defines intellectual capital as a set of intangible assets (resources, capabilities, competition) which are achieved through organizational performance and value creation.
3. Edvinsson and Malone define intellectual capital as the information and knowledge applied to the work to create value.
4. Bentis and Holland, in their article in 2002, defined intellectual capital as follows: "intellectual capital shows the reserve of knowledge available in a certain time in an organization". This definition focuses on the relationship between intellectual capital and organizational learning.
5. Broking describes intellectual capital as a combination of all the intangible assets that empower the company in works and operations.
6. According to Skandia, intellectual capital encompasses knowledge, applied experience, organizational technology, customer relationships and professional skills that provide a competitive cut in the market for Skandia.
7. Recently, researchers have suggested a general definition for intellectual capital which also defines the requirements for recognition of this asset: "Intellectual capital is a type of property that measures the ability of the enterprise to create wealth. This asset lacks an objective and physical nature and is an intangible asset which is achieved through utilizing assets related to human resources, organizational performance and relationships outside the enterprise. All these features create values within organizations and because the earned value is a completely internal happening, it is not merchantable" (***Rass and Baroness, 2005***).

Although it seems that these definitions consider different approaches for intellectual capital, shared elements are observed among them. Intellectual capital includes intangible resources. These intangible resources form a series of linkage relationships, and knowledge assets should consider evaluation and measurement issues by linking the elements of intellectual capital. Reporting intellectual capital must also face the specific challenge that it is not always possible to protect the proprietary rights governing these resources in an organization. For example, there are proprietary rights for the trademarks; however, these rights are not true about the organizational culture of the institution and the skills of staff while these intellectual capital help to create the value. The implicit and general aspect of intellectual capital is in the heart of the major problems faced by the reporting of intellectual capital.

Factors limiting the ability of intellectual capital to create value

1. Limited barriers: lack of physical nature for intangible resources makes it hard to create barriers for competitors in accessing these assets. Although passing laws on the protection of patent rights in recent decades has largely reduced this problem but it is not fully guaranteed.
2. Inherent risk: to provide intangible resources, a large initial investment is required in comparison with tangible resources. Increasingly rapid changes in factors considered by the market as well as technologies cause barriers for management while assessing modern innovations and since changes are tremendous, expanding intangible resources is highly riskier than tangible resources.

Characteristics of Intellectual Capital

Despite the apparent similarities between intellectual capital and tangible assets in the potential to generate future cash flows, there are some characteristics that differentiate the intellectual capital from these assets, which are as follows:

1. Intellectual properties are non-competitive financial assets. Unlike physical assets that only can be used to do a certain job at a certain time, intellectual property can be used simultaneously for several particular tasks. For example, a customer support system can support thousands of customers at a time. This ability is one of the most important measures for the superiority of intellectual assets on physical assets.
2. Human capital and relational capital cannot be personal properties, but must be shared between employees, customers, and suppliers. Therefore,

the development of this type of property requires care and attention.

Intellectual capital vs. non-tangible assets

Terms "intellectual capital" and "non-tangible assets" are often used interchangeably. The extent and the scope of this concept are basically different. While intellectual capital includes all sources of knowledgebased intangible assets, non-tangible assets are defined as intangible and financial assets which are identifiable by a non-physical nature. An (intangibles) asset is a resource which is controlled by the institution as a result of the past events (such as internal purchase or production) and is expected that to create future economic benefits (cash flows of other assets). In this concept, an intangible asset has the following features:

1. It should be based on the definitions of recognition and detection.
2. It should be under the protection of the law.
3. It should be under private ownership and the private ownership should be legally transferable.
4. There should be a visible evidence for the existence of an intangible asset.
5. It should be created at an identifiable time or as the result of an identifiable event.
6. It should be end at an identified time or as a result of an identifiable event.

Obviously, only a small part of the intellectual capital meets these requirements. Royalties and trademarks are examples of assets that significantly meet these conditional standards. However, most capital assets are not so. No one can recognize the particular point of time when the customer loyalty is created, the innovative spirit of in an ended organization, or the transfer of an employee education, information and technology. In addition, it is often difficult to link an intellectual capital, such as a hierarchical structure or a mission, to visible improvements in the production of goods and services, or improvements in usefulness. These are some main reasons for why there is no pricing formula for capital asset.

The importance of intellectual capital

The global shift in the economy from the manufacturing sector to the economy based on intangible resources and the service sector has increased the attentions to knowledge and intellectual capital and its effect on the firm performance, and the relationship between financial returns and corporate performance is highly regarded in emerging and developing economies. The relationship between intellectual capital and corporate performance has been experimentally studied in many countries including America, Canada, China, Malaysia, Germany, etc. Terms "intangible", "knowledge assets" and "intellectual capital" are widely used on accounting, economics and management literature; however, the potential value and the future benefits they have are not reliably measurable. In general, the productivity of companies depends on the intellectual capital and the organization capabilities in using them as an asset. Stewart points out that a major revolution has occurred in information and knowledge based economy era, so that the working asset is replaced by information and physical assets are replaced by intellectual capital. In fact, the physical and material benefits are greatly replaced by the knowledge and communication as the main sources of value and wealth, and in the new era, the new economy is emerging in the form of intangible economy. The digital revolution in the economy caused the rise of new concepts including the meta-material economy, the weightless economy, and the software economy. These concepts states that the driving factor of the economy is not anymore a material, but it is a weightless and immaterial thing like information and knowledge.

In the strategic management literature, many researches have been conducted on the company's resources and sustained competitive advantage. Intellectual capital includes non-physical resources, the values associated with manpower capabilities, organizational resources, operational processes, and connection with the stakeholders. In today's organizational conditions, considering the knowledge and the skills of manpower, communications and organizational culture is the most important factor for competitive advantage and firm performance.

Efficient and effective management of companies always requires the proper tools and techniques to understand the contemporary management issues. Today, the economy and the standards of value creation have changed, and intangible resources and intellectual capital are new leverage to deal with the environmental and structure changes. Business performance increasingly requires a management active in intellectual capital and intangible resources contexts to achieve sustainable returns for shareholder.

However, a feature of knowledge-based economy is considerable investment in human capital and information technology. However, the current reporting system, investors have no accurate understanding about the true value of the company and its future.

Losses that will be imposed into capital markets, if the information in this type of investment is not disclosed, suggest the importance of intellectual capital. Examples of these losses are:

1. The minor the shareholders may have no access to information related to intangible assets in private meetings held with major shareholders.
2. If managers use information derived from internal decisions regarding intangible assets without informing other investors, the probability of happening a bargain according to confidential information is increased.
3. The risk of improper valuation of companies is increased and this makes bankers and investors to consider a higher risk level for organizations.
4. The cost of capital increases. In case of the disclosure of such information, due to the less uncertainty regarding the future outlook for the organization, the company will be valuated more accurately and capital costs can be reduced.

The elements of intellectual capital and knowledge assets

In general, researchers and those involved in the field of intellectual capital agree that the intellectual capital is made up three elements including human capital, structural capital and relational capital, which are explained as follows:

1. Human Capital: ***Rass et al.*** (***1997***) argue that employees create intellectual capital through their intellectual competence, attitude and agility. The most important elements of human capital are the workforce skills, and depth and extent of their experience. Human resources can be regarded as the spirit and the mind of intellectual capital. This type of capital, at the end of the working day, quits the company when employees leave the company the, but structural capital and relational capital remain unchanged even when the organization is left. Human capital includes:

a) Skills and competencies of the workforce;

b) Knowledge of the workforce on subjects that are important for the success of the organization; and

c) Talents, ethics, and behavior of the workforce. Broking believes that the human assets of an organization include skills, expertise, abilities to solve problem, and leadership styles. The high level of staff turnover in an organization may mean that the organization has lost this important component of intellectual capital.

2. Relational Capital: relational capital includes all relationships between the organization and any individual or other organization. These individuals and organizations can include customers, agents, employees, suppliers, regulatory authorities, communities, creditors, investors, etc. The relationships are divided into two categories according to their purpose :

The first category includes those relationships which are formal through contracts and commitments with customers and suppliers, or main partners; and the second one mostly includes informal relationships.

Bentis states that the new definitions have extended the previously existed concept of customer asset to relational asset which include the knowledge in the relations that the organization has developed with customers, competitors, suppliers, commercial associations, and the government.

Customer capital is considered as a bridge organizing the operation of intellectual capital and is a determinant for converting the intellectual capital to market value. This capital includes the strength and the loyalty of customers and relations. Customer capital indicators include market share, customers retaining, and the profit earned from each customer. Customer capital, among all types of intangible assets, is probably worst managed. Many business owners do not even know who their customers are.

3. Structural Capital: structural capital is the knowledge available in the organization. This asset belongs to the whole company and it can be recreated and traded with others. Rass et al. believe that the structural capital includes all non-human resources in the organization including databases, organizational charts, operating instructions for processes, strategies, implementation plans, and generally whatever has a meta-material value for the organization. Due to the diversity of structural capital components, it is usually decomposed to organizational, process, and innovation capital.

Organizational capital includes systems that are used to empower and lever the capabilities of the organization. The process capital involves techniques, procedures, and programs used to improve the transportation of goods and services. Innovation capital includes intellectual and intangible properties. Intellectual properties are preserved trade rights such as copyrights and trademarks. Intangible properties are other talents by which the organization operates. Structural capital covers a wide range of essential elements the most important of which often includes:

1. Key executive processes;
2. The structuring approach;
3. Politics, information flows, and databases;
4. Leadership and management styles;
5. Organizational culture;
6. Plans for rewarding employees.

Structural capital can be divided to subsets including culture, operations and work habits, and intellectual property.

Objectives of measuring the intellectual capital

Investigating more than 700 papers in the field of intellectual capital measurement, ***Marr et al.*** (***2003***) showed that there are five general objectives for measuring intellectual capital which are stated at the following:

1. To assist organizations to formulate strategies ;
2. To evaluate the implementation of strategies ;
3. To help the expansion and diversifying the company's decision-making ;
4. Non-financial measures of intellectual capital cab be linked to repayment and rewarding plans of managers;
5. To build a relationships with outside shareholders who hold intellectual capital.

The three first objectives are related to internal decisions they aim to maximize the company's operational performance in order to make revenue by the minimum cost and to continuously improve the relationships with customers and suppliers, and market share. The fourth item is related to executive incentives and the fifth one implies on making motivates for stakeholders outside the organization. Various studies have shown that the measurement of intellectual capital is necessary and beneficial for having both internal effective governance and successful relationships with people outside the organization. It is clear that if the initial objective of profit companies is the effective and efficient management of future cash flows, the management of final stimulus for cash flows, i.e. intangible assets, will be critical for these companies. Because how you want to manage what you cannot measure? Because of this, measuring intellectual capital and in general intangible assets is critical.

Endrisson (***2002***) also considers enhancement of internal management, improvement of external reporting, legal and trading incentives as the reasons of measuring intellectual capital. There are several methods to measure intellectual capital which are discussed at the following:

Classification of methods for measuring intellectual capital

In a general classification, the measurement techniques for intellectual capital are divided into four general categories.

First category: direct intellectual capital techniques

These techniques evaluate the monetary value of intellectual assets via the various components of such assets. Among the mentioned techniques, technology agent, accounting and human resource costing, value finder, direct intellectual capital and human resources accounting are located in this category.

Second category: market investment techniques

These techniques are based on the calculation of the difference between the market value for the company's stock and the capital in the hands of its shareholders and considering the difference as intangible asset or intellectual capital. Between all the 14 techniques, the invisible balance sheet model, the market to book ratio and Tobin's Q are in this category.

Third category: return on assets techniques

These **techniques** compute the average pre-tax income of the company for a specified period and divide the obtained value to the average value of the physical assets in the same period. The economic added value and intangible values are calculated using this procedure and belong to this class.

Fourth category: the scorecard techniques

In these techniques, various components of intangible assets or intellectual capital are identified and either the indicators prepared in scorecards are reported for them or they are shown in the diagrams. Balanced scorecard, Scandia navigator, intangible asset control, value chain score results belong to this class.

Conclusions

Intellectual capital is defined as knowledgebased assets that create financial values in the organization, but are not listed in financial statements. The intangible nature of these assets and their absence in financial statements increase the importance of these assets, and their identification and measurement. However, the organization must manage all categories and the human capital systems, because having access to organizational goals is possible only through the process of activities of human capitals. Therefore, it was noted that different types of human capital need different human resource systems, and applying one system for all will decrease the productivity. In addition, organizations should consider other types of knowledge such as social capital and organizational capital. Therefore, it is required for researchers to conduct studies on how to combine different types of knowledge (human, social and organizational) to achieve competitive advantage. In the new economy, organizations compete in a complex and dynamic environment where the uniqueness and knowledge value creation in the organization causes competitive strategies. Since in recent years, as a consequence of privatization policies, some service organizations in the country have been or are being privatized, measuring the effect of intellectual capital on organizational performance in the sector, the efficiency of such policies can also be evaluated.

References

1. Anvari, A., Seraj, H., (2003), "Assessing the Models and Methods for Measuring the Intellectual Capital of Firms", Journal of Science and Research for Accounting and Auditing Studies, Management Department, University of Tehran, No. 34.
2. Anvari, A., Seraj, H., (2005), "Assessing the Intellectual Capital and the Relationship between Intellectual Capital and the Stock Market Value of Companies in Tehran Stock Exchange", Journal of Science and Research for Accounting and Auditing Studies, Management Department, University of Tehran, No. 39.
3. Hajiha, Z., (2010), "Reporting of Intellectual Assets in a Knowledge Management System", Journal of Rubber Industry in Iran. pp. 102.
4. Ghelichli, B., Moshabaki, A., (2007), "The role of Social Capital in Creation of Intellectual Capital in Organizations: a case study for two automobile companies", Journal of Management Knowledge, No. 75, pp. 125-147.
5. Zanjirdar, M., Cohan, A., Soltanzade, A., (July 2008), "Management, Measurement, and Reporting Intellectual Capital ", Journal of the Chamber of Commerce, No. 4, pp. 10.
6. Roslender R, Fincham R. 2003. Intellectual capital reporting in the UK: a field study perspective. Accounting, Auditing and Accountability Journal 17: 178–209.
7. Mayo A. 2001. The Human Value of the Enterprise: Valuing People as Assets: Monitoring, Measuring, Managing. Nicholas Brealey Publishing: London.
8. Tang T. 2005. Human resource replacement cost: measures and usefulness. Cost Engineering 47: 14–21.
9. Bontis N, Chua Chong Keow W, Richardson S. 2000. Intellectual capital and business performance in Malaysian industries. Journal of Intellectual Capital 1: 85–100.
10. Grasenick K, Low J. 2004. Shaken, not stirred: defining and connecting indicators for the measurement and valuation of intangibles. Journal of Intellectual Capital 5: 268 281.
11. Tseng C, Goo YJ. 2005. Intellectual capital and corporate value in an emerging economy: empirical study of Taiwanese manufacturers. R&D Management 35: 187–201.
12. Wang WY, Chang C. 2005. Intellectual capital and performance in causal models: Evidence from the information technology industry in Taiwan. Journal Intellectual Capital 6: 222–236.
13. Ho YK, Xu Z, Yap CM. 2004. R&D investment and systematic risk. Accounting and Finance 44: 393 418. Huang K. 1997. Capitalizing collective knowledge for winning, execution and teamwork. Journal of Knowledge Management 1: 149–156.
14. Al-Horani A, Pope PF, Stark AW. 2003. Research and development activity and expected returns in the United Kingdom. European Finance Review 7: 27 46.
15. Bejar Y. 2008. Informational value of intellectual capital and survival of French technology firms on the long term. Paper presented at the 17th EFMA Annual Conference (Athens).
16. Amir E, Lev B, Sougiannis T. 2003. Do financial analysts get intangibles? European Accounting Review 12: 635-659.
17. Luft JL, Shields MD. 2001. Why does fixation persist? Experimental evidence on the judgment performance effects of expensing intangibles. Accounting Review 76:561–587.
18. Kohlbeck M, Warfield TD. 2007. Unrecorded intangible assets: abnormal earnings and valuation.Accounting Horizons 21: 23–41.
19. Catasus B, Grojer J-E. 2003. Intangibles and credit decisions: result from an experiment. European Accounting Review 12: 327–355.
20. Contractor F. 2000. Valuing corporate knowledge and intangible assets: some general principles. Knowledge and Process Management 7: 242–255.
21. Clarke T, Rollo C. 2001. Capitalising knowledge: corporate knowledge management investments. Creativity and Innovation Management 10: 177–188.
22. Mouritsen J. 2003. Intellectual capital and the capital market: the circulability of intellectual capital. Accounting, Auditing and Accountability Journal 1: 18–30.
23. Lubit R. 2001. Tacit knowledge and knowledge management: the keys to sustainable competitive advantage. Organizational Dynamics 29: 164–178.
24. Riahi-Belkaoui A. 2003. Intellectual capital and firm performance of US multinational firms: a study of resource-based and stakeholder views. Journal of Intellectual Capital 4: 215–226.
25. Mouritsen J, Flagstad K. 2004. Managing organizational learning and intellectual capital. International Journal of Learning and Intellectual Capital 1: 72–90.
26. Williams RL, Bukowitz WR. 2001. The yin and yang of intellectual capital management: the impact of ownership on realizing value from intellectual capital. Journal of Intellectual Capital 2: 96–108.
27. Lev B. 2001. Intangibles: Management, Measurement and Reporting. Brookings Institution Press: Washington.
28. Stewart Stolowy H, Jenny-Cazavan A. 2001. International accounting disharmony: the case of intangibles. Accounting, Auditing and Accountability Journal 14: 477–496.
29. Seetharaman A, Helmi Bin Zaini Sooria H, Saravanan AS. 2002. Intellectual capital accounting and reporting in the knowledge economy. Journal of Intellectual Capital 3:128–148.
30. Mouritsen J, Larsen HT. 2005. The 2nd wave of knowledge management: the management control of knowledge resources through intellectual capital information. Management Accounting Research 16: 371–394.