Does Information System Simulate Intellectual Capital? Experience from IT Industries of Dhaka Stock Exchange (DSE), Bangladesh

Abdul Kadar Muhammad Masum*, Muhammad Showkat Imran** and Mohammad Jonaed Kabir***

Knowledge Management (KM) is the key to Wealth Maximization for any type of business. Here, the real challenge is to identify how to accelerate the transformation of knowledge into money through identification and measurement of knowledge as assets. All the IT industries (numbering 5) in 2010-2011 have taken under the study. The research depicts a positive relation in the growth of Intellectual Capital (IC) with the improvements and advancement of Information Technology (IT) in the respective firms over Dhaka Stock Exchange (DSE). In oppose, a huge number of investors from DSE seem ignorant regarding IC. Only a minor portion of the institutional investors have been using IC and measurement tools for their investment procedure. Throughout the study, the importance of training and awareness creation has built up to uplift professionalism and success in wealth maximization.

Keywords: Intellectual Capital, Capital Market, Knowledge Management, Wealth Maximization

Field of Research: Business and Management

1. Introduction

Today, the world has accomplished the transition to a service economy and is end route in the direction of an information economy, where the prime sources of capital are considered to be information. This includes not only scientific knowledge, but also communication, entertainment, services, news, information sharing and working processes. Therefore, Information System (IS) plays key strategic role in creation Intellectual Capital (IC) (Edvinsson & Malone, 1997; Housel & Nelson, 2005). O'Donnell, O'Regan, & Coates (2000) opined that the key to success in the competitive and networked economy is suitable the ability to envision, create and influence the spectacle termed as Intellectual Capital.

_____
*Assistant Professor, Department of Business Administration**,** International Islamic University Chittagong, Bangladesh**,** email: akmmasum@yahoo.com
**Assistant Professor, Department of Business Administration, International Islamic University Chittagong, Bangladesh, email: imraniiuc@yahoo.com
***Assistant Professor, Department of Business Administration, International Islamic University Chittagong, Bangladesh, email: mjk_iiuc@yahoo.com

A fashionable article of Adrian (2008) in the Daily Telegraph recommended that many large associations could continue no longer than 24 hours without IT support! There should be tiny phenomenon that attitudes to the progress of information systems have transformed over the years from an ad hoc almost inconsiderate approach to a professionally achieved, disciplined, planned, and engineering approach. Simply contemplate an organisation like Telecom industry, accountants having to by hand calculate, millions of customer bills every month! Clearly the ecclesiastical effort involved would make it problematic if not impossible for the administration to make a profit. Similar opinions apply to many other associations such as the high street banks, central government. Scenario would be worse if it is a nuclear or airspace project. So, Information technology and IS allow all of these companies to ensure profitability and growth, no doubt. Jump to a sharp end, IS of a firm, has developed a self confidence to investors which reflects positively in capital market. This paper highlighted importance of IS to uphold corporation's potential to increase Intellectual Capital as well as presence of IC in the said industry as an asset and the reflection on the capital market.

Objectives of the Study

The prime objective of the study is to trace out the relationship of IC and IS especially their characteristics and movement along with capital market performance; Dhaka Stock Exchange (DSE). In addition, this paper will give intent look at;
1. Existing tools for measurement and management of IC of a firm;
2. Ways, in which IS may help to improve IC;
3. Experience from DSE to reconnoitre changes in IC due to change in IS; and
4. Recommendations to improve the scenario so that IC of a firm will response as in desired level with the change in IS.

The study is designed into four main chapters among which Motivation of the research amplifies and critically evaluate the importance and prevailing gap for the further study, followed by Methodology explaining the process of analysis. Findings and analysis chapter is dedicated to discuss the issues we found and finally recommendation gives further research scope and suggestions.

2. Motivation of Research

Housel & Nelson (2005) recommended that the fundamental building material of wealth of the modern businesses is the creation and utilization of knowledge. The real encounter in the Information age is to recognize how to accelerate the adaptation of knowledge into money through empathetic how to measure knowledge assets (Kanevsky & Housel, 1998, p. 1). Earl (1989) extends Porter's work by demonstrating the strategic role that Information Technology (IT) can play to address these powers. The result of Earl's work is a 'multiple' procedure. The methodology adopts a three split approaches to strategic information systems improvement. The first prong involves the top-down examination of business objectives using Critical Success Factors (CSF), SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis and Porter's five forces. The second prong involves bottom-up investigation of existing systems and the third prong highlights the inventive use of IT. Bullen & Rockart (1984) have fashioned a

strategic information systems methodology grounded on CSF analysis. The methodology comprises the analysis of business goals and objectives and the factors critical to accomplishing those objectives. The next stage is the credentials of the information systems essential for backing these CSFs.

The discussion, so far, has highlighted a holistic approach, looking at high level business purposes rather than detailed functional necessities. These approaches accentuate the importance of shared corporate data, an issue which will be argued in detail in the next subdivisions. These are, but a few symbols of the way IS and IC, dynamic changes. Large companies are reorganising their relationships with customers and suppliers. Unexpected opportunities are opening up for small- and medium-sized companies (SMEs) as found by Farkas-Conn (1999).

3. Literature Review

Adrian (2008) depicts that Intellectual Capital is best described as information and knowledge within a company .Information is static; whereas, knowledge is dynamic. The partly unspoken, intangible and socially comatose nature of this vigorous process is such, moreover, that it can never be totally observed by either contributors or observers (O'Donnell, O'Regan, & Coates, 2000). Marr (2005, p. 56) originated that intellectual assets embody the firm's growth opportunities, "contributing to both their evolution over time and their realization in the future". So, firm value from a finance perspective can be viewed as: value of assets in place plus value of future growth opportunities from assets in place value of future growth opportunities from new assets. In addition, Marr (2005, p.60) reviles the second and third elements of this value proposition are "largely path dependent and derive from the firm's accumulation of resources and capabilities from past investments".

Many or most of these problems could be addressed by a method to estimate sub-corporate cash flows, i.e. cash flows for IC assets such as people, processes, and information technology (Housel & Nelson, 2005)**.** Taking account Bangladesh scenario, a customary tradition of respondents can be considered as highlighting problem for research which is negligence and partial reporting (Mobarek & Mollah, 2005). A Deeper thought suggests, respondent in most cases don't realise importance and use of research which perform as great hindrance for getting absolute value of research.
Above all, weak form of market efficiency of DSE (Islam & Khaled, 2005) always adds a negative thought of quality working with DSE data. In fact, limited work with emerging capital market for instance DSE is behind such performance. However, (Islam & Khaled, 2005; Mobarek & Mollah, 2005) found a positive trend of DSE in terms of market efficiency.

Nevertheless, more training and a minimum entry requirement might be a simple solution for such lacking in the knowledge development use flexible capital market performance. Most importantly, investors need to be proactive to grape the contemporary knowledge to use in their investment decision and for professional confidence to do wealth maximization. Theoretical changes of literal definition of IC can

be assumed through table 1, where key definitions of different author at different time have been summarized;

Table 1: Signals identified by definitions of authors that indicate importance of IS in IC development.

Author	Intellectual Capital
Hall (1992)	May be classified as "assets" (e.g. brand, trademark, contracts, databases) or "skills" (e.g. know-how of employees, organizational culture)
Edvinsson and Sullivan (1996)	Knowledge that can be converted into value.
Stewart (1997)	Intellectual material that has been formalised, captured, and leveraged to produce a higher-valued asset
Bontis et al. (1999)	It is a concept that classifies all intangible resources as well as their interconnections
Marr and Schiuma (2001)	It is composed of all knowledge-based assets, distinguished between organizational actors (relationships, HR) and infrastructure (virtual and physical)
Marr & Schiuma (2004)	A long-term competitive advantage can only be gained from the management of the knowledge assets underlying organizational capabilities.
(Housel & Nelson, 2005)	Intellectual Capital may enhance through identification, measurement, innovation and development of IT

As with the accounting definition in table 1, the finance definition of intellectual assets indicates that they have no immediate, measurable, or certain payoffs (income streams); and due to their embedded nature, are not susceptible to the development of a secondary market by which they could be valued. Sudarsanam et. al. (2003) suggest that financial valuation models can be divided into two groups: static (historically based) and dynamic (prospectively based). They provide the following discussion of both groups. Static mode is developing an approximation of value as of a quantified valuation date. The assets being esteemed are normally aggregated at the firm level, although intellectual property (IP) such as copyrights and brands are often valued unaided.

3.1 Static Model Valuation Approaches Include

Residual Income Model extracts the after-tax incomes attributable to financial and physical assets from the firm's after-tax earnings to arrive at a residual; the knowledge earnings that can be make the most of at an appropriate discount rate. This model is an irregular of the old-fashioned financial valuation "Excess Earnings Approach."

Technology Broker Model uses an audit questionnaire to identify the firm's intellectual asset categories. Then apply traditional valuation approaches (market, income, or cost) to each category. The market approach uses market comparable as a

benchmark for asset value. The income approach estimates the income-producing capability of the asset. The cost approach estimates value based on the asset's replacement cost.

Market- or value-based approach takes the difference between the stock market value of the firm and the net market value of its assets.

Tobin's Q takes the difference between the market value of the firm and the replacement cost of its tangible assets.

3.2 Dynamic Valuation Models Include

The Discounted Cash Flow Model estimates future asset cash flows and discounts them using a market-determined discount rate. This model requires relatively stable, predictable cash flows and the ability to estimate an appropriate discount rate.

Real Options Models uses financial option pricing models to value intellectual assets, since intellectual assets are, in effect, real options created by the firm through such activities, investments, or acquisitions as: Investments in IT and human resources, customer relationship arrangements, intellectual property (IP), R&D, and practices and routines.

Real Options Models uses financial option pricing models to value intellectual assets, since intellectual assets are, in effect, real options created by the firm through such activities, investments, or acquisitions as: Investments in IT and human resources, customer relationship arrangements, intellectual property (IP), R&D, and practices and routines.

It is a matter of great depression that developing countries like Bangladesh has still zero knowledge about such important value making element for their corporations. As a result any research work or their results cannot be incorporated here for the findings of previous lacking of research and scope. However, it is better late than never. This particular research work is simply giving a new horizon to the future researchers as fact for thought.

4. Methodology

The concept "Intellectual Capital" is in the primary stage of research to come up with a final and concrete mathematical solution to measure and evaluate. So far, researchers, worldwide, have introduced the qualitative methods to recognise it. The main purpose of the study here is to develop a scenario of the present condition of the process in Bangladesh perspective. Here, only five companies that are working in IT industry and also incorporated with Dhaka Stock Exchange (DSE) namely; AGNISYSL(Agni Systems Ltd.), BDCOM(BDCOM Online Ltd.), DAFODILCOM(Daffodil Computers Ltd.), INTECH(In Tech Online Ltd.), ISNLTD(Information Services Network). Both, primary and secondary data have used for the study.

4.1. Primary Data

To analyse the perception of investors and company managers, a set of two questionnaires including both of the sectors are used and compiling with few direct and few five likers scale questions. Some open ended questions also incorporate to develop the recommendation part for the study. The study period is assued 2010-2011 calander year for the collecting of data.

The sample size is 100 respondents from DSE participants. 25 percent of them are from the defined five IT companies who have been working as senior manager or higher. 50 percent of them are personal investor selected randomly. Rest of them have been in touch with DSE for more than five years and the rest are less than five years as institutional investor.

Finally, responses for the respondents have run through SPSS 13 V- a sophisticated statistical tool, to identify the key indication of the proposed objectives. Since the objective is to find the level of understanding, if any, of the investors for IC, in depth statistical tools were not used. Here, the research limits to identification of frequency table of the proposed factors.

4.2. Secondary Data

Secondary data for the study is relatively limited as it has been discussing for really short time in the developed countries and in the context of Bangladesh, it is absolutely new concept. However, the study has used journal articles, newspaper edited information and few books for gathering the basic understanding and to develop critical use of the approaches here.

5. Analysis and Findings

Primary data which has used for statistical analysis depicts absolute absence of Knowledge Management and Intellectual Capital concern into the general investors and an initial presence of these theories among the institutional investors. A more details and to the point findings of the study are shown as below;

A. Among the total recipients, 56 percent only knows the term IC and its prospects in capital market performance. 95 percent of the institutional investor knows very little about IC and remaining knows on an average but not in details. 36 percent of the individual investor knows the term but only 8 percent of them know in details.

B. It seems very interesting that only three percent of the recipients know the term IC for more than five years whereas, the term is in use and practiced by the investors for more than 20 years. Though formal recognition and use seems limited.

C. As a matter of fact, it seems interesting that, local newspapers and media, specially journal and researchers are not interested in contemporary information.

Less than one present of the known recipients came to know the term from local newspapers. A major part of the knowledge group comes to be familiar with it from foreign magazine and friends.

D. More surprisingly information that this research finds is only eight percent of the known investors has training from the authentic source for the knowledge and use of IC in business and wealth creation.

E. Poor but positively reported by the investors that, only 12 percent of the known group has find reflection of the use of IC comes true even though 88 percent reported it never works. The main reason behind that might be ignorance and lack of parameters for measuring true reflection of IC in practice. However, compare to the recent market performance, it seems very good in condition. Since the developed countries are also facing problem in calculation this asset in true sense.

F. 96 percent of the total respondents have shown positive remark for the chances of having more technological support and training for the use and practice of new financial concept by training and creative writings. However, remaining four percent shows importance in personal interest rather giving absolute guidance.

G. In relation with the market portfolio, A huge number of recipients, numbering 67 percent seems have graduate and higher educational qualification and remaining has less or no qualification. With the result of ignorance and awareness, probably this is one of the main reasons that market remains performing in a bad mood and into a semi strong efficiency.

H. Market seems over situated by the investors having market portfolio of $60000 or less capital which indicates high fluctuation in terms of decision making. Not only this, most of them performing in the market having almost no or little professional training for investment in capital market.

I. Institutional investors finds the similar response of using IC theory in practice and they seems reluctant in using such theory since the market as whole-most investor (individual) finds it difficult to understand and use.

J. Last but not the least, a big number of institution investor suggested using parameter, for example, simple professional training introduced by the government and Security Exchange Commission as an entry requirement for an investor, more professional training and discussion in contemporary development in local and foreign investment areas.

6. Limitation

A review of the literature indicates that all financial valuation models have the same limitations in one form or another:

A. IC assets must be valued as an aggregate with no ability to separately value individual assets (other than certain types of IP) (Freedman, 2004);

B. Differences in the national, industry, and firm accounting standards and policies that govern the recording of the IC assets create a lack of comparability of value estimates (Housel & Nelson, 2005);

C. An inability to define either exactly how much IC assets contribute to firm value or the process by which they do so (Montequin, at el 2006);

D. Difficulty in estimating the replacement cost of IC assets, their future cash flows, or the risk (volatility) and uncertainty (probabilities) associated with these cash flows (Bontis, 1999);

E. Difficulty in capturing path dependencies and asset synergies in value estimates (Kaplan & Norton, 1992); and

F. F. Lack of historical data to use benchmarking and forecasting (Edvinsson& Malone, 1997)

7. Conclusion

In recent time, a knowledge society is the source of everything which is shaped by the information revolution and advanced by communication technologies. At the dawn of this new age, the concept of intellectual capital(IC) has been used for the first time to explain importance of intellectual resources - such as information, knowledge, and experience - in the modern economy.

Many authors have explained the importance of intellectual capital, comparing it to technological advances in the past. Since the beginning, developments of sciences and technology improvements have been the precursors of change in society and the economy: in the past, steam, electricity, transport, all contributed to the creation of new social and economic development, generating original forms of business, working processes and products.

Intellectual capital, therefore, is an imperceptible asset that has displaced industrial machinery and natural assets, and is today reflected one of the most valuable factors for the creation of wealth, being at the same time foundation and final product. The management of intellectual resources has thus become the most significant task of business, governments and people in present-day society.

References

Adrian A 2008, 'Intellectual Capital in the World of Information Economies', *Journal Of International Commercial Law And Technology,* vol.3, no.4, pp. 45-57.

Bontis N 1999, 'Managing Organizational Knowledge By Diagnosing Intellectual Capital', *International Journal Of Technology Management,* vol.18, no.5, pp.433-445.

Edvinsson L & Malone M 1997, 'Intellectual Capital, *New York: Harpercollins.*

Farkas-Conn I 1999, 'Globalization And Information Technologies: New Emerging Partnerships', *Bulletin of the American Society for Information Science.* vol.25, no.5, pp.45-57.

Freedman E 2004, 'Knowledge Management: Not Just For Big Firms', *Law Technology News, vol.*23, no. 02.

Hall R 1992,'The Strategic Analysis Of Intangible Resources', *Strategic Management Journal.* Vol.13, No.2,pp.2-15.

Housel TJ & Nelson S 2005, 'Knowledge Valuation Analysis; Applications for Organizational Intellectual Capital', *Journal of Intellectual Capital,* vol.06, no.04, pp. 544-557.

Kanevsky V & Housel T 1998, 'The Learning-Knowledge-Value Cycle. Knowing In Firms: Understanding', *Managing and Measuring. London.*

Kaplan R & Norton D 1992, 'The Balanced Scorecard Measures that Drive Performance', *Harvard Business Review.*vol.32,no.1, pp.34-45.

Islam S & Khaled A 2005, 'Visualising And Measuring Intellectual Capital: A Research Method', *Journal of Business Studies.* vol.21, no.4, pp.8-22.

Marr B 2005, 'Perspectives On Intellectual Capital – Interdisciplinary Insights into Management', *Measurement and Reporting. Boston, MA: Elsevier.*

Marr B & Schiuma G 2004, 'Intellectual Capital – Defining Key Performance Indicators For Organizational Knowledge Assets', *Journal of Intellectual Capital*, vol. 10, no.5, pp.501-569.

Montequin VR, Fernandez FO, Cabal VA & Gutierrez NR 2006 'An Integrated Framework for Intellectual Capital Measurement and Knowledge Management Implementation In Small And Mediam- Sized Enterprises', *Journal Of Information Science.* vol.6, pp.32-525.

O'Donnell D, O'Regan P & Coates B 2000,'Intellectual Capita; A Lhabermasian Introduction', *Journal Of Intellectual Capital.* vol.1, no.2, pp.187-200.

Mobarek M & Mollah AK 2005, 'The Core Competence Of The Corporation', *London Business Review.* vol.48, no.3, pp.78-97.

Stewart T 1997, 'Intellectual Capital: The New Wealth Of Organizations', *Doubleday/Currency. New York.*

Sudarsanam S, Sorwar G & Marr B 2003, 'Valuation Of Intellectual Capital And Real Options Models', *PMA Intellectual Capital Symposium. London.*