Challenges of Intellectual Capital and its Valuation Models

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Abstract

Many of current accounting systems have neglected the growing importance of intellectual property rights and knowledge in modern organizations; therefore, they aredisable from evaluating real value of assets. In other words, the real values of the company’s financial statements in the dissections have many limitations. In today's knowledge-based societies, applied intellectual capital efficiency is much higher than return on capital. It means that, importance of intellectual capital, in determining sustainable profitability, will decrease in the future. This issue led to distance between real value of companies and organizations. Intellectual capital evaluation model can help organizations to identify distance between competitors, consumer demand and organizations have best intellectual capital management. In addition, model helps organizations become aware of the functions of the various intellectual capitals and seek to identify components of capital in inside and outside the organization.

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INTRODUCTION

The course of the industrial age to the information age society, the importance of intellectual capital has increased.

Several studies designating an organization’s knowledge resources as its intellectual capital have underscored the notion that knowledge is utilized through different approaches in an organization.

The authors of these studies consider intellectual capital to be the sum of all knowledge firms utilize for competitive advantage [1,3]. More importantly, it is the conceptualization of different aspects of intellectual capital that offers scholars a means to parsimoniously synthesize the approaches by which knowledge is accumulated and used in organizations. Previous research has identified three prominent aspects of intellectual capital: human, organizational, and social capital. Human capital is defined as the knowledge, skills, and abilities residing with and utilized by individuals [2], whereas organizational capital is the institutionalized knowledge and codified experience residing within and utilized through databases, patents, manuals, structures, systems, and processes [3]. The third aspect, social capital, is defined as the knowledge embedded within, available through and utilized by interactions among individuals and their networks of interrelationships.

At a basic level, the conceptual separation of these three aspects of intellectual capital is evident from how each aspect accumulates and distributes knowledge differently: either through (1) individuals, (2) organizational structures, processes, and systems, or (3) relationships and networks. Other key attributes, however, further highlight their inherent differences. Individual expertise and its associated human capital may or may not stay within organizations and can change depending on the hiring, mobility, and turnover of employees. Conversely, institutionalized knowledge and its associated organizational capital stay within organizations and do not change very easily [4]. As for social capital’s preservation, it tends to function more like organizational capital than human capital. Yes, social capital comprises a network of individuals who each have the option to leave their organization, however it is rare that this individual mobility destroys the viability of the overall network. Since social capital stems from norms for collaboration, interaction, and the sharing of ideas.

Components of intellectual capital:
1. Human capital: People who are source of innovation
2. Structural human: tool is used for sharing and knowledge transfer.
3. **Customer Capital**: it means relationship, which create valuation. Intellectual capitals created by relationship between components of human, structural and customer capital.

**Human capital:**

Human capital is important because it is a source of innovation and strategic renewal, whether it is from brainstorming in a research lab, daydreaming at the office, throwing out old files, re-engineering new processes, improving personal skills or developing new leads in a sales rep’s little black book. The essence of human capital is the sheer intelligence of the organizational member.

The scope of human capital is limited to the knowledge node (i.e. internal to the mind of the employee). It can be measured (although it is difficult) as a function of volume (i.e. a third degree measure encompassing size, location and time). It is also the hardest of the three sub-domains of intellectual capital to codify. The Nobel Prize-winning economist Theodore W. Schultz (1981) has also used the term human capital:

The decisive factors of production in improving the welfare of poor people are not space, energy, and cropland; the decisive factors are the improvement in population quality and advances in knowledge. These advancements can be augmented by appropriate investment in human capital.

**Structural Capital:**

An organization with strong structural capital will have a supportive culture that allows individuals to try things, to fail, to learn, and to try again. If the culture unduly penalizes failure, its success will be minimal.

Structuring intellectual assets with information systems can turn individual know-how into group property [5]. It is the concept of structural capital that allows intellectual capital to be measured and developed in an organization. In effect, without structural capital, intellectual capital would just be human capital.

This construct therefore contains elements of efficiency, transaction times, procedural innovativeness, and access to information for codification into knowledge. It also supports elements of cost minimization and profit maximization per employee. Structural capital is the critical link that allows intellectual capital to be measured at an organizational level.

**Customer capital:**

Customer capital represents the potential an organization has due to ex-firm intangibles. These intangibles capitals include the knowledge embedded in customers, suppliers, the government or related industry associations. The arrows represent the knowledge that must flow from external to the organization (i.e. its environment) into the organization’s core by way of linked nodes. The essence of customer capital is knowledge embedded in relationships external to the firm. Its scope lies external to the firm and external to the human capital nodes. It can be measured (although it is difficult) as a function of longevity (i.e. customer capital becomes more valuable as time goes on). Owing to its external nature, knowledge embedded in customer capital is the most difficult to codify.

One manifestation of customer capital that can be leveraged from customers is often referred to as “market orientation.” There is no consensus on a definition of market orientation, but two recent definitions have become widely accepted. The first is from Kohli and Jaworski [6], who define market orientation as the organization-wide generation of market intelligence pertaining to current and future needs of customers, dissemination of intelligence horizontally and vertically within the organization, and organization-wide action or responsiveness to market intelligence. Similar definitions are found in Deng and Dart [7] and Lichtenthal and Wilson [8]. The second is from Narver and Slater [9], who define market orientation as one dimension construct consisting of three behavioral components and two decision criteria – customer orientation, competitor orientation, inter-functional co-ordination, a long-term focus, and a profit objective. With close parallels to Kohli and Jaworski [6], Narver and Slater [9] include the generation and dissemination of market intelligence as well as managerial action.

**Methods of measuring intellectual capital: Balanced Scorecard Basics:**

The balanced scorecard is a system that is used extensively in business and industry, government, and non-profit organizations worldwide to align business activities to the vision and strategy of the organization, improve internal and external communications, and monitor organization performance against strategic goals. It was originated by Drs. Robert Kaplan (Harvard Business School) and David Norton as a performance measurement framework that added strategic non-financial performance measures to traditional financial metrics to give managers and executives a more 'balanced' view of organizational performance. While the phrase balanced scorecard was coined in the early 1990s, the roots of the this type of approach are deep, and include the pioneering work of General Electric on performance measurement reporting in the 1950’s and the work of French process engineers (who created the Tableau de Board – literally, a "dashboard" of performance measures) in the early part of the 20th century.
Skandia Model:

It is the first model, which considered, honest and consistent effort to measure knowledgeable assets creates intellectual capital. Edvinsson (2000) developed dynamic model named navigator of intellectual capital reporting by focusing on five levels:

1. Financial capital
2. Customer capital
3. Renewal Capital
4. Processing capital
5. Human capital

Based on this model, factors of structural and human capital sum structural and human capital is equal with intellectual capital.

Skandia is considered the first large company to have made a truly coherent effort at measuring knowledge assets. Skandia first developed its IC report internally in 1985, and became the first company to issue an IC addendum accompanying its traditional financial report to shareholders in 1994. Other companies including Dow Chemical’s initiatives in valuing its R&D and patent process have relied extensively on Skandia’s multi-dimensional conceptualization of organizational value.

Leif Edvinsson, the chief architect behind Skandia’s initiatives developed a dynamic and holistic IC reporting model called the Navigator with five areas of focus: financial, customer, process, renewal and development, and human capital. This new accounting taxonomy sought to identify the roots of a company’s value by measuring hidden dynamic factors that underlie “the visible company of buildings and products”. According to Skandia’s model the hidden factors of human and structural capital when added together comprise intellectual capital.

Market value Added (MVA):

MVA is one way of measuring inventory, valuation, and show difference between evaluating a company and booked value in one time and a place.

According to Bentis et al. (1999), MVA can represent the market’s assessment of the net present value of a company’s current and contemplated capital investment projects. As such, MVA is significant summary assessment of corporate performance” (p.395). However, a key disadvantage with MVA is that gains and losses accruing from historic activities are aggregate don a one-to-one basis with last year’s results plus today’s moods as they are shown in market price. As a result, a company with a successful history will keep on showing positive and high MVA even when current or future prospects are bleak and unrewarding.

Economic Value Added:

EVA:

Economic value added is a fashionable management performance measure pioneered by Stern Stewart & Company, a management consulting firm. EVA emphasizes the residual wealth creation in a company after all costs and expenses have been charged including the firm’s cost of capital invested. In its simplest terms, EVA measures how much economic value in dollars; the company is creating, taking into account the cost of debt and equity capital. EVA is simply calculated as follows:

\[
EVA = \frac{\text{Net Operating Profit after Taxes}}{\text{Weighted Average Debt and Equity Capital}}
\]

Bentis et al. (1999) define EVA as “the difference between net sales and the sum of operating expenses, taxes and capital charges where capital charges are calculated as the weighted average cost of capital multiplied by the total capital invested. In practice, EVA is increased if the weighted average cost of capital is less than the return on net assets, and vice versa.” Its equation is given below:

\[
\text{Net sales} - \text{operating expenses} - \text{taxes} - \text{capital charges} = EVA
\]

Bentis et al. (1999) further liken EVA to an accounting concept introduced much earlier, that of residual income (RI). RI represents the value remaining after a company’s stockholders and all other providers of capital have been compensated. The sole distinction the authors make between EVA and RI is that EVA has simply been paid more attention. Given its positive reception, some writers have suggested that EVA can be used as a surrogate measure for the stock of intellectual capital if it can be assumed that effective management of knowledge assets increases EVA.
EVA is one of the newest methods of evaluating performance of organizations, which was described by Stewart (1997). This method is focusing on maximizing wealth of shareholders. EVA is calculated by cash flow minus capital cost of cash flow. Therefore, it shows real income against accounting income. EVA is against difference between net sale and total operational cost, tax and capital cost. Obviously, EVA is measure for intellectual capital and proper information provide effect intellectual capital on performance.

\[
EVA = NOPAT_t - [(TA_t - 1 - CL_t - 1) \times WACC_t]
\]

\[\text{Tat-1} = \text{Total assets in first of year}\]
\[\text{CLt-1} = \text{Total current liabilities at beginning of financial period}\]
\[\text{NOPATt} = \text{Net operational income after minus tax in fiscal year}\]
\[\text{WACCt} = \text{Average cost capital in fiscal year}\]
\[\text{Opt} = \text{Gross operational income in fiscal year}\]
\[\text{WD} = \text{Weight debt}\]
\[\text{KD} = \text{Cost of Debt}\]
\[\text{Ke} = \text{Cost of new common stock}\]
\[\text{Ws} = \text{Weight Retained Earnings}\]
\[\text{Ks} = \text{Accumulated interest rate}\]

\[\text{Tobin } Q:\]

Economics theory of investment behavior where 'q' represents the ratio of the market value of a firm’s existing shares (share capital) to the replacement cost of the firm’s physical assets (thus, replacement cost of the share capital). It states that if q (representing equilibrium) is greater than one (q > 1), additional investment in the firm would make sense because the profits generated would exceed the cost of firm’s assets. If q is less than one (q < 1), the firm would be better off selling its assets instead of trying to put them to use. The ideal state is where q is approximately equal to one denoting that the firm is in equilibrium. Also called general equilibrium theory or ‘q’ theory, it was proposed by the US Nobel laureate economist James Tobin (1918).

Indexes of intellectual capital:

Intellectual Capital Index is an attempt to unify all the different individual indicators and create relationship between intellectual capital and market changes. Intellectual Capital Index is an attempt to unify all the different individual indicators. Based on intellectual Capital Index has the following distinct components:

- This method is a measurement method depends on individual attitudes.
- It focuses on showcasing a dynamic intellectual capital.
- This method is generally based on physical inspection of the property, has a clear view of the company.
- The index method is that if the changes do not reflect the market value of the company will amend its indicators of intellectual capital management strategy allow an understanding of the real impact on the company’s intellectual capital and intellectual capital to provide a shaped top view.
- Assessing prospects, this model considers each part three perspectives. These perspectives are important factors that distinguish an organization from its competitors.
- Identify related indexes. The selected indicators are easy to interpret as well as evaluate and monitor specific elements to provide about strategic and managerial information. This index is a simple framework for the analysis of all components of intellectual capital without preferring one sector to provide other sectors.
- Possible ability to make comparisons. The comparison between the realities of the business model provides different rewards and focuses on monitoring the dynamics of intellectual capital.
Conclusion and Discussion:
In current economy, intellectual capital is one of key sources in value creation. This research showed there have been various definitions from intellectual capital; however, there is no standard definition. Furthermore, in recent years due to changes in economic conditions of the industries that rely on their physical and financial assets of the knowledge-based economy, which relies on the intangible assets. Organizations only can survive in competitive knowledge-based world, which use non-physical assets like intellectual capital. At the organizational level, the intellectual capital evaluation model can help organizations identify the current state of their intellectual capital and identify distance themselves from competitors, demand of users and organizations have intellectual capital management. Furthermore, the model helps organizations become aware of the functions of the various intellectual capitals and tend to identify components of capital in inside and outside of organizations. Eventually, one organization can evaluate this system by managerial actions in each department with corresponding to science and knowledge in order to achieve outcome of clerk to design objectives in order to improve intellectual capital in each department and clerk.

REFERENCES

Table 1: Indexes of intellectual capital

<table>
<thead>
<tr>
<th>Labor productivity</th>
<th>Financial turn over</th>
<th>Total staff</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time of the Year</td>
<td>Real-time Operation</td>
<td>Using the maximum time</td>
</tr>
<tr>
<td>Employee’s share of higher education</td>
<td>Number of employees with higher education</td>
<td>Number of employees</td>
</tr>
<tr>
<td>Employee’s share of secondary education</td>
<td>Number of employees with secondary education</td>
<td>Number of employees</td>
</tr>
<tr>
<td>The share of employees working in extra time</td>
<td>Number of employees with overtime</td>
<td>Number of employees</td>
</tr>
<tr>
<td>Instability in staff</td>
<td>Input the number of employees</td>
<td>Output number of employees</td>
</tr>
<tr>
<td>Frequency teamwork</td>
<td>Number of team work</td>
<td>Duration (days)</td>
</tr>
<tr>
<td>Frequency of internal meetings</td>
<td>Number of internal meetings</td>
<td>Duration (days)</td>
</tr>
<tr>
<td>share of IT Professionals</td>
<td>number of IT professionals</td>
<td>Number of employees</td>
</tr>
<tr>
<td>Frequency of computer problems</td>
<td>The number of recorded computer problems</td>
<td>Duration (days)</td>
</tr>
<tr>
<td>share of employees receiving training</td>
<td>Number of employees receiving training</td>
<td>Number of employees</td>
</tr>
<tr>
<td>share of employees with leadership positions</td>
<td>Number of employees with leadership positions</td>
<td>Number of employees</td>
</tr>
<tr>
<td>share of new consumers</td>
<td>number of consumers in the last year</td>
<td>Number of clients</td>
</tr>
<tr>
<td>Market share</td>
<td>Value of sales</td>
<td>Sale value of total market</td>
</tr>
<tr>
<td>Share suppliers</td>
<td>Number of suppliers</td>
<td>Total number of suppliers</td>
</tr>
<tr>
<td>frequency of the TV</td>
<td>Number of appearances on TV</td>
<td>Duration (days)</td>
</tr>
</tbody>
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