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Abstract

Several indicators are constructed to measure intellectual capital at inter-organisational and inter-organisational level. The majority of models constructed so far have not established the link between individual intellectual items and organisational intellectual capital performance. The few models that establish such a link demand significant management time to monitor them, or have established indices outside the traditional accounting system. The Intellectual Accounting Scorecard integrates intellectual capital measuring and reporting into mainstream traditional accounting reporting. Firstly it identifies each intellectual capital item as an intellectual revenue and intellectual expenses having an impact on the statement of income, or as an intellectual assets and intellectual liabilities having an impact on the balance sheet. Secondly, it constructs ratios to monitor operational and strategic performance.

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INTELLECTUAL ACCOUNTING SCORECARD - MEASURING AND REPORTING INTELLECTUAL CAPITAL

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ABSTRACT

Several indicators are constructed to measure intellectual capital at inter-organisational and inter-organisational level. The majority of models constructed so far have not established the link between individual intellectual items and organisational intellectual capital performance. The few models that establish such a link demand significant management time to monitor them, or have established indices outside the traditional accounting system. The Intellectual Accounting Scorecard integrates intellectual capital measuring and reporting into mainstream traditional accounting reporting. Firstly it identifies each intellectual capital item as an intellectual revenue and intellectual expenses having an impact on the statement of income, or as an intellectual assets and intellectual liabilities having an impact on the balance sheet. Secondly, it constructs ratios to monitor operational and strategic performance.

Keywords: Intellectual Accounting Scorecard, Non financial measurements, intellectual capital, intellectual capital reporting

Intellectual Accounting Scorecard - Measuring and Reporting Intellectual Capital

INTRODUCTION

Although there is ambiguity as to whether intellectual capital represents all intangibles, the more popular definitions indicate that they refer to intangibles not recognised in the financial statements. A study in 1997 of top Canadian and US organisations reveals that non-financial will be the key to business success in the future. The organisations identified five broad categories to measure performance, and they are customer service, market performance, innovation, goal achievement, and employee involvement. The most commonly used performance measure in firms was customer service and market performance. The firms tend to rely on non-financial measures that have been used for some time and indicated that they rely less heavily on measures related to reputation, know-how, information systems, databases, and corporate culture although they play an increasing importance in the future to ascertain the performance of a firm (Stivers, Covin, Hall, & Smalt, 1997). Sveiby (1997b) outlines three reasons why companies do not want to measure intangible assets, and they are: managers themselves do not understand the importance of it; indicators can give too much information away to the competitors; and there is no rigorous theoretical model for such a type of reporting. Since accounting systems are not designed to extract such information easily, it could be time consuming and expensive to make such reporting. Even if they are measured, the research also reveals that firms did not want to share human capital indicators externally since they feared losing talented employees to competitors (Miller, DuPont, Jeffrey, Mahon, Payer, & Starr, 1999). On the other hand, capitalising intangibles leads to increase subjectivity of cash flow analysis, difficulty in breaking intangibles into individual valuations, and almost the impossibility of determining when the recognition criteria of intangible assets are met to include them in the balance sheet (Backhuijs, Holterman, Oudman, Overgoor, & Zijlstra, 1999). The use of non-monetary indicators can help to avoid such problems to some extent. Measuring non-financial data is still an art more than a science and in intellectual capital the choice of indicators can affect the results substantially (Roos, Roos, Dragonetti, & Edvinsson, 1997, p. 60). Like in environmental reporting (Kirkman & Hope, 1992), there is no universally acceptable model to measure intangibles. However, various models proposed at least point to the right direction (Guthrie & Petty, 2000a). The measurement of intellectual capital is important since most of the senior executives in organizations manage what has been measured (Roos & Roos, 1997) and the organization becomes what it measures over time (Hauser & Katz, 1998).

INTELLECTUAL CAPITAL PERFORMANCE INDICES AT MACRO LEVEL

To evaluate and compare the existence of intellectual capital, researchers have used three broad indicators at organizational level. These indicators are derived from the audited financial statements of a firm and are independent of the definition of intellectual capital of a firm. There are three major indicators to measure net intangible assets at a firm level (Stewart, 1997, pp. 224-229) and they are market to net book value, Tobin's q, and calculated intangible value (CIV). Apart from them, other methods include direct intellectual capital method, Baruch Lev's knowledge capital valuation and Paul Strassmann's knowledge capital valuation.

(i)   Market to net book value

Intellectual capital is the difference between the market value and financial capital of that enterprise at a given date (Abdolmohammadi, Greenlay, & Poole, 2001; Dzinkowski, 2000; Knight, 1999; Roos,Roos, Dragonetti, & Edvinsson, 1997, pp. 2; Sveiby, 1997a, pp. 3-18). The reliability and usefulness of it can be improved by converting it to a ratio (Stewart, 1997, pp. 224-225), and is the most widely known indicator (Knight, 1999). The traditional accounting measures net identifiable assets using a combination of costing methods, such as historical costs, present value, replacement cost and market value. The market on the other hand values its net assets of a firm holistically, and they are assets and liabilities, both identified and not identified by the traditional accounting system. Some authors use market to net book value as the basis to construct indices. For example, the composite IC index is indirectly linked to the market value of the firm. When the index does not correlate with the market value, the choice of weights or indicators or the capital forms of the index are revised (Roos, Roos, Dragonetti, & Edvinsson, 1997, pp. 78-79; pp. 92-93). If the ratio is more than 1, it indicates that the organization contains intellectual assets not represented by the financial statements. Training as a percentage of payroll cost was significantly and positively associated with market-to-book value indicating that Wall Street values more highly firms investing in training than others. However, if the ratio is less than 1.0, the firm may still have intellectual assets but they can be masked by intellectual liabilities (Harvey & Lush, 1999; Caddy, 2000).

(ii)   Torbin's q:

This indicator was initially developed by the Nobel-prize-winning economist James Tobin to predict the investment behaviour. Tobin's q is used to explain phenomena like investment and diversification decisions, relationship between managerial equity and firm value, financing, dividend and compensation policies. This method requires valuing assets in the traditional accounting by replacement cost (Chung & Pruitt, 1994) and the ratio of market value to the replacement value represents intellectual capital/assets. Firms invest or divest until the Tobin's q becomes 1.0, until it's higher rather than normal returns on its investment becomes normal return. (Flamholtz & Main, 1999). Tobin's q overcomes the weakness in the traditional accounting measurement system by ignoring that measurement system (Stewart, 1997, pp. 225-226; Dzinkowski, 2000). Tobin's q ratio is related to the quality of investment opportunities than its industry affiliation (Chung, Wright, & Charoenwong, 1998). However, since Tobin's q was developed during the industrial era economy, in the knowledge economy, Tobin's q can give a false indication of over-valuation of knowledge-based firms (Flamholtz & Main, 1999).

(iii)   Calculated intangible value (CIV)

The CIV was developed by NCI Research to calculate the fair market value of intangible assets of a firm. It uses a three-years period for averaging of pre tax earnings and tangible assets to arrive at company's return on assets to compare with the industry average (Abdolmohammadi, Greenlay, & Poole, 2001; Stewart, 1997, pp. 226-229; Dzinkowski, 2000). This method offers potential within an industry and between industry comparisons but has two limitations; it uses an average and not actual return on assets to determine excess returns, and company's cost of capital dictates the net present value of intangible assets (International Federation of Accountants, 1998).

(iv)   Direct Intellectual Capital method

This method is based on calculating the value of each intellectual capital item (Abdolmohammadi, Greenlay, & Poole, 2001). One of the problems of this method is that intellectual capital valuations are still not perfected and it is not easy to identify all intellectual capital items in an organisation.

(v)   Baruch Lev's Knowledge Capital Valuation

This method employs both past and future earnings projects. Knowledge capital is calculated as the difference between normalised earnings and earnings from tangible and financial assets. The value is calculated by dividing knowledge capital by knowledge capital discount rate. Although this technique has predictive capability, it requires more effort to apply (Westphal, 2001).

(vi)   Paul Strassmann's Knowledge Capital Valuation

This technique uses 'economic profits' (financial capital rental) as a basis. Knowledge capital is calculated as the difference between profits and financial capital rental. Knowledge capital is divided by interest rate of cost of long-term debt. Although it is easy to apply, it is not a forward-looking technique (Westphal, 2001).

INTELLECTUAL CAPITAL PERFORMANCE INDICES AT MICRO LEVEL

(i)   Indicators as drivers of the vision

There are many difficulties in analysing indicators, and organizations can overcome these difficulties by aggregating intellectual capital indicators into an intellectual capital (IC) index. The scaling enable organisations to make inter-organisational comparisons (Roos & Roos, 1997). IC index does not represent the total stock of IC, but it can capture changes in the IC level (Roos, Roos, Drgonetti, & Edvinsson, 1997, pp.7-8).

(ii)   Indicators to represent intellectual categories

Knowledge-based organisations make a higher emphasis on intellectual capital indicators than capital-intensive firms and the relative importance of each category varied depending on their importance to the firm. Managers in firms are more in agreement with usefulness of human and customer capital indicators than structural capital indicators ((Miller, DuPont, Jeffrey, Mahon, Payer & Starr, 1999; Stewart, 1997, pp. 140). The findings also point to the need to adopt a more comprehensive approach (Simister, Roest, & Sheldon, 1998, p. 13) to managing all categories of intellectual capital but the indicators should be meaningful to managers in their industry.

Telia Ab (1996) shows how Telia (the Swedish National Telecommunication Company) practically applied indicators to ascertain human capital category in Sweden. Since 1990, Telia have published an annual statement of human resources with many key ratios displayed in graphical form. Telia Ab has used several indicators under the headings of number of employees, personnel mobility, absenteeism, industrial injuries and remuneration. In addition to the indicators, Telia Ab also presents a human resource balance sheet and human resources income statement.

Sveiby (1997b) discusses the construction of Intangible Assets Monitor™ that created a 'Swedish Community of Practice' in the mid 80s. The Intangible Assets Monitor™ indicates the change in intellectual assets in relation to

growth and renewal, efficiency, and stability in three individual intellectual capital structures, namely, external, internal and competence (Sveiby, 1997a, pp.163-184; Sveiby, 1998a). Sveiby (1997b) outline the usefulness of using financial indicators such as ratios, quotient and non-financial indicators such as employee turnover, and argues that indicators concentrate a great deal of information into digits and are fast and easy to create and work in any system Sveiby (1997(b)). There is no difficulty in designing indicators but the difficulty lies with interpreting the outcome (Sveiby, 1998b).

Another technique is to analyse intellectual capital by five categories, namely, financial, customer, human, process and renewal capital (Edvinsson & Malone, 1998, pp. 67-69). Due to hundreds of intellectual capital variables, extracting meaningful information can be difficult. Intellectual Capital mapping enables firms to map the intellectual capital into a landscape representing the health of the company. This allows firms to more effectively analyse the data in the said five categories (Kitts, Edvinsson, & Beding, 2001).

Cascio (1998) categorises intellectual capital into human, customer and structural capital and outlines how to measure them in real life. He argues that unstoppable business changes such as globalisation, technology, change, speed in market change and cost control are factors that supports monitoring intellectual capital by indicators for each category.

(iii)   Indicators to represent return on intellectual capital items
The return on knowledge assets on individual intellectual capital items is another approach. The return is computed as the difference between the revenue generated by the products less costs incurred for using the knowledge asset in activities to produce products. The costs are ascertained using activity-based costing principles. Different approaches can be used to distribute product revenues over activities and knowledge assets. The proposed model has several limitations. It relies on assumptions and definitions that cannot be proved to be appropriate. Also, the organisation should operate in a process-oriented way and the method only provides the value derived from the processes. It also assumes that the knowledge areas under consideration get a price for its products on a market. The value of knowledge area is based on the current value and therefore may not suit highly innovative organisations where future value is more important than the current value. For such organisations a macro instead of a micro approach is suitable (Dekker & de Hoog, 2000). The return on assets concept is also applied into human capital (Fitz-enz, 2000, p.34-37).

LIMITATIONS OF THE PREVIOUS MODELS

Since measurement models of intellectual capital items are not widely accepted, constructing ratios is a useful way to report their performance. However, non-financial indicators discussed in the literature have several limitations. Firstly, the non-financial indicator models proposed in the literature at micro level are independent of organisational level indicators, except for the IC index where it links the indices to the market value. IC index demands a lot of management attention to keep revising the weighting attached to indices. Secondly, the non-financial indicators at micro level are independent of the traditional accounting system except in the Intangible Assets Monitor. However, they help managers to report intellectual capital performance. Intellectual capital items should be identified and indices constructed by, those having a profit impact, balance sheet impact and cash flow impact so that those ratios can become part of the mainstream reporting to the management. Thirdly, non-financial indicators should directly or indirectly link to the fair value of the firm since it is the barometer of existence of intellectual capital. It is evident that shareholders are unable to judge the fair value of the firm (Lev, Sarath, & Sougiannis, 1999) and that could be why the sale value of a firm is different from the market value. However, in an efficient capital market, market value is a good proxy to the fair value of the firm. In the absence of the market value, firms can use industry-specific stock exchange indices. Fourthly, previous non-financial indicators have underestimated the resulting impact of feelings, emotions and attitudes of employees, such as absenteeism, strikes, and relations with internal and external people and institutions and their importance in creating value to the firm.
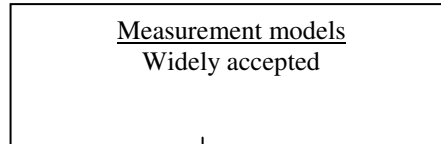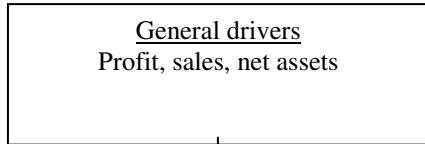
PROPOSED APPROACH-INTELLECTUAL ACCOUNTING SCORECARD

The statement of cash flows is a derivative of balance sheets of two periods and the statement of income for the period (Abeysekera, 2003). Firstly, the proposed approach identifies intellectual capital items by those having an impact on profits for the period and others having an impact on the balance sheet. Figure 1 provides a framework to construct such ratios and a list of illustrative intellectual capital items.
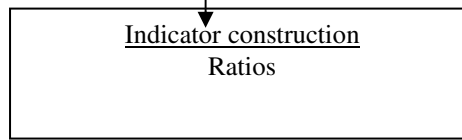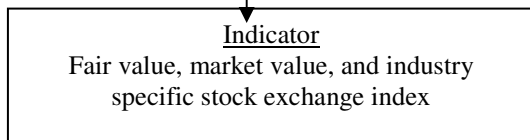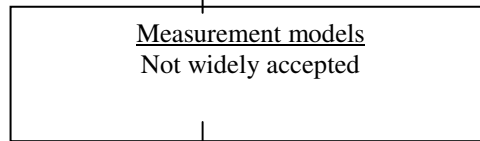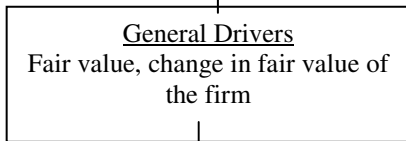
Figure 1

Intellectual Accounting Scorecard

Financial items

General drivers Profit, sales, net assets	Measurement models Widely accepted

Intellectual Items

General Drivers Fair value, change in fair value of the firm	Measurement models Not widely accepted

Indicator Fair value, market value, and industry specific stock exchange index	Indicator construction Ratios

Intellectual capital items fitted into the traditional accounting system

Statement of Income

Intellectual revenue items:
- Training
- Know how
- Competence
- Favourable publicity
- Customer retention rate

Intellectual expense items:
- Complaints
- Absenteeism
- Relations with unions
- Adverse publicity
- Sick leave
- Accidents

Balance Sheet

Intellectual Asset items:
- Education cost
- Learning cost
- Brand loyalty
- Intellectual property
- Customer loyalty
- Organisation enhancing customers
- Expert seniority
- Technological processes

Intellectual Liability items:
- Labour turnover
- Proportion of big customers
- Duty, levy, tax increases

Secondly, ratios are constructed in relation to the fair value or change in the fair value of the firm. This is because fair value represents the intellectual capital of the firm, and change in fair value represents the change of intellectual capital for the period. The individual ratios therefore indicate their positive or negative contribution towards intellectual capital of the firm. Thirdly, it is important to determine the level of increased focus the firm has on given intellectual capital category or categories. For example, a trading firm will have more focus on external capital and a R&D firm is likely to have more focus on human capital. Fourthly, firms must identify the strategic and operational goals of the firm and its key performance indicators. Fifthly, it is important to construct ratios to support its strategic and operational goals so that they can be integrated into key performance indicators. The intellectual capital item ratios constructed in relation to the statement of income, highlight the operational performance of intellectual capital, ratios of the balance sheet

highlight the strategic performance of intellectual capital and ratios of cash flows highlight the impact of intellectual capital on cash flow management. Appendix lists illustrative ratios in relation to the statement of income, balance sheet, and statement of cash flows.

CONCLUSION

The indicators constructed to determine intellectual capital in total and itemised intellectual capital offer a useful guide to ascertain the status and trends in intellectual capital of a firm. Although each model proposed have its own limitations they all have contributed to better ascertain intellectual capital of a firm. Most definitions point to intellectual capital being the all other capital not recognised by the financial statements and explains the gap between the net book value and fair value of a firm. However, some models constructed to monitor individual intellectual capital items have not related each intellectual item to the overall impact of intellectual capital. Even the models that have addressed the link between the impacts of individual intellectual items to the overall intellectual capital have done so in a fashion that demands substantial management time to create such indices and monitor them. Further, the indices developed have an indirect relationship with the traditional accounting system demanding management to monitor intellectual capital outside their normal reporting framework. The proposed Intellectual Accounting Scorecard acknowledges that the basic framework of financial reporting, that is, income statement, the balance sheet and the statement of cash flows, are going to stay, and it is necessary to integrate intellectual capital reporting into the mainstream reporting of firms. Intellectual capital items are identified by their impact on the statement of income and the balance sheet to construct ratios to integrate them into the key performance indicators of the firm, having an operational impact, strategic impact and a cash flow impact. The type and nature of ratios can vary depending on the type of firm, and its strategic and operational focus.

Illustrative ratios of the Intellectual Accounting Scorecard

Statement of Income:

Statement income has an operational focus. Therefore, its performance is compared against the change in fair value, or market value as a proxy.

Ratios with an impact on Revenue (Intellectual Revenue Ratios):
- Investment in training/change in market value
- Number of understudies/change in market value
- Level of competence index (ex. Obtained from a survey)/change in market value
- Number of favourable media releases/change in market value
- Average repeat sales per customer during the period/change in market value

Ratios with an impact on Expenses (Intellectual Expense Ratios):
- Number of complaints/change in market value
- Cost of absenteeism/change in market value
- Loss of person hours due to disagreements with unions/change in market value
- Cost of sick leave/ change in market value
- Cost of work related accidents/change in market value

Balance Sheet:

Balance Sheet has a strategic focus. Therefore, its performance is compared against the fair value, or market value as a proxy as at given date.

Ratios with an impact on assets creation (Intellectual Assets Ratios):
- Money invested in education of employees/market value
- Brand loyalty (ex. Determined by increase in revenue in constant money)/market value
- Number of active intellectual property/market value
- Average repeat sales per customer for last five years/market value
- Average length of work experience of professionals in the firms/market value
- Sales per organisation enhancing customers/market value
- New investments in technological processes/market value

Ratios with an impact of liability creation (Intellectual Liability Ratios):
- Cost of labour turnover/market value
- Proportion of sales from 5 big customers/market value
- Increase in duty on products/market value

Illustrative ratios of the Intellectual Accounting Scorecard

Statement of Cash flows:

Statement of cash flows has both an operational and a strategic focus. The impact on operational cash flows is compared against the change in market value, and the impact on investing and financing cash flows is compared against the market at given date.

Ratios with an impact on operational cash flows (Intellectual Operational cash flows ratios):
- Cash paid on training/ change in market value
- Cash paid Discounts offered and other incentives to customers/ change in market value
- Money spent to restore adverse publicity/change in market value
- Cash paid due to work related accidents/change in market value
- Difference in overdraft interest rate of the firm and standard overdraft interest rate/change in market value
- Difference in overdraft interest rate of the firm and overdraft interest rate of the rest of the group/market value

Ratios with an impact on investing cash flows (Intellectual Investing cash flows ratios):
- Cash outlay to enhance customer loyalty (ex. Incentive programs, specific advertisements, and publicity)/market value
- Cash outlay in upgrading technological processes/market value
- Cash outlay on successful R&D/market value
- Cash outlay on unsuccessful R&D/market value

Ratios with an impact on financing cash flows (Intellectual Financing cash flows ratios):
- Difference in long term interest rate of the firm and standard long term interest rate/market value
- Difference in long term interest rate of the firm and standard long term interest rate/market value
- Difference in long term interest rate of the firm and long term interest rate of the rest of the group/market value

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