

Measuring Intangible Capital: A Review of Current Practice

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Abstract

This paper overviews international practices that measure firm-level investments into intangible capital. The paper is motivated by the large and ever increasing effort directed to developing metrics to measure intellectual capital. This effort is a response to the demand from corporations for these services which reflects a perceived gap in internal and external financial reporting on intangible investments. The main conclusion of the paper is to suggest that the way forward to a standardised, more comparable approach to measuring intangible capital is to employ a back to basics “costs” approach which classifies investments in intangible capital as assets based on management intent at the time the investments are made.

Keywords: Capital, Intangible assets, Measurement

JEL: M41; M20

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1 Introduction

This paper overviews international practices that measure firm-level investments into intangible capital (IC). Consistent with the economic literature, “intellectual capital” is viewed in this paper as a sub-set of “intangible capital” where the term “intangible” relates to assets without a physical existence, while “capital” refers to assets retained by the organization to contribute to future profits (see Webster 1999).¹ The paper begins with a brief definition of intangible capital and a discussion of why firms seek to invest in it. The paper documents existing measurement approaches in use around the world and the (primarily) consultants that provide these services, offering an analysis on the possibility of standardised applications of these efforts. Throughout the paper, we discuss where the “official” measurement system, accounting, fits in this schema, suggest some reasons for the perception that accounting has failed to measure IC, and relate the “official” and “unofficial” approaches to measuring intangible capital. The primary contributions of the paper are (1) to bring together a cross-section of the extant literature and practice on the measurement of IC in one forum; (2) to provide an analysis of the differences and problems associated with both the properties of the “official” and “non-official” measurement approaches; and (3) provide some informed suggestions for how to move forward in IC measurement.

The issue motivating this paper is the large and ever increasing effort directed to developing “unofficial” metrics to measure IC. There is clearly a demand from corporations for these services, which anecdote suggests are motivated by a perceived gap in the “official”

¹ There is a lack of consistent terminology in the literature relating to intangible assets and intellectual capital. Management scholars tend to employ either “capital” or “asset” terminology to refer to investments with no physical existence. Lawyers refer to intellectual property, which has property rights in law. Accountants do not generally use the term “intellectual capital”. Accountants refer to identifiable intangible assets, goodwill, and intellectual property (with legal rights) under the umbrella of “intangible assets”. Economists refer to intangible assets in terms of their source, as investments, and role in production, as capital. Some authors regard intellectual capital as a subset of intangible assets, and this is the view adopted in this paper. See also Section 2 following.

accounting treatment of IC.² A review of these (unofficial) efforts using the available public data reveals commonalities in terminology (i.e., around the terms human capital, intellectual capital and so forth), but the purpose and frameworks are diverse (e.g., there are proponents employing “scorecard” approaches versus those employing EVA^{TM3} approaches). When the metrics employed are reviewed, it is difficult to identify patterns where they can be related to a purpose of measurement. Moreover, the metrics tend to mix backward-looking cost-based measurement with forward-looking valuation concepts which we argue adversely affects the interpretability of the resulting measures of IC.

The main conclusion of the paper is to suggest that the way forward to a standardised, more comparable approach to measuring IC is to employ a back-to-basics “costs” approach which classifies investments in intangible capital as assets based on management intent at the time the investments are made. To summarise the logic, accounting since early times is charged with the task of providing a “cost” based accounting of the capital contributed by owners and lenders, and the way these monies are spent. This “cost measurement” function has come under pressure one manifestation of which is the burgeoning “unofficial” IC measures—in response to a perceived gap in “official” IC measurement. Comparing the two, we find that the “unofficial” metrics tend to mix cost and valuation concepts, while the “official” measures have a problem with misclassification of intangible investments (assets) as expenses. This “misclassification” is motivated by accounting “conservatism” but this does not equate to prudence since it increases Type I measurement errors: when assets (investments) are classified erroneously as expenses. Of the two aforementioned problems, we

² Some companies report intangible assets in Australia but overall the quantum reported relative to total assets and the market value of the company is very small (Wyatt 2005). For an economics-based discussion of the intangibles data gap see Griliches (1990) and for empirical evidence see Webster (2000).

³ EVA is Economic Value Added.

suggest that a less costly remedy to the IC measures gap in the short-term is to address the misclassifications problems associated with the “official” measurement system.

The remainder of the paper is organised as follows. In section 2, we first consider the question of what is IC. Section 3 reviews the evidence on managements’ motivations for measuring intangible capital. Section 4 describes current practices in unofficial measures of IC, and documents the many heterogeneous forms of unauthorised IC metrics in use. Finally, section 5 summarises the key observations, and problems identified in relation to the unofficial IC measurement practices.

2 What is Intangible Capital (IC)?

A company or a firm’s capital comprises any assets retained by the organisation that are expected to contribute towards future profits.⁴ The most universally recognised types of capital present themselves in tangible form, such as real estate and plant and equipment and accordingly, these are well defined and measured in company accounts. However, it has become increasingly obvious to managers that intangible forms of capital, most notably those bound up in the skills and knowledge of the workforce and the organisation of the work unit, also contribute to profits. In fact, any monetary outlays made by the firm in the expectation of future profit that are not immediately embodied in tangible form, constitute intangible investment.

Because in most cases IC cannot be seen, cannot be owned, cannot be used as collateral, have uncertain values and may not be separable from the organisation, it has proved difficult

⁴ In this context, the future means beyond the immediate time horizon of one year.

to obtain agreement on how to systematically account for these items—within the firm for management purposes and externally to stakeholders. Accounting regulators have dealt with the problem by employing a “control over future benefits” test to define an asset and a “historical cost” basis of measurement to record the asset. Although there was a time when the accounting focus was on “value” related concepts (such as how to measure the firm’s economic income), the role of accounting has never been to value the company or its assets but to provide information inputs (i.e. costs) to valuation (Beaver 1998; Ohlson 1995). In addition, unless expenditures are embodied in a physical form and associated with a verifiable transaction, they are classified as expenses rather than assets, even though future benefits may be expected well into the future (e.g., expenditures giving rise to information technology infrastructure, patents, trademarks). To provide useful information about the allocation of resources and the outcomes of these decisions, the practice of “cost” measurement, thus, relies heavily on classification of costs as expenses or assets. Expenditures that have expired (or been consumed) give rise to expenses, while costs with future service potential give rise to assets (investments). This “cost measurement” function has come under pressure, manifested in the burgeoning “unofficial” IC measures, which appear to be a response to a perceived gap in “official” accounting measurement of IC. In fact, the “official” measures have a problem with misclassification of intangible investments (assets) as expenses (e.g., see Lev 2001). This “misclassification” is motivated by the accounting conservatism principle.

We argue that this is conservative only with respect to Type II errors – errors incurred when expenses are misclassified as investments. However, this practice actually increases Type I measurement errors: when assets (investments) are classified as expenses. Because the external reporting (accounting) standards influence the structure and content of the internal accounting system, this effect filters through to internal accounting systems. Accordingly,

intangible forms of capital are commonly acknowledged but not formally recorded in company internal accounting system or external financial reports.

Nonetheless, because managers increasingly understand that these assets, or enterprise attributes, can be the key to competitive advantage (see footnote 9 for examples of empirical evidence), methods for measuring intangible capital have sprung up around the world. A range of operational descriptions of IC have been developed by different authors and these include:

- Intellectual material that has been formalised, captured and leveraged to produce a higher valued asset (Klein and Prusak 1994);
- Accumulated value of investments in employee training, competence and the future (Skandia, 1996);
- Combined intangible assets of market, intellectual property, human-centred and infrastructure which enable the company to function (Brooking, 1996 in Bontis, *et al.* 2000);
- Information and knowledge applied to create value (Edvinsson and Malone 1997);
- Knowledge, information, intellectual property, experience that can be put to use to create wealth (Stewart, 1997);
- The holistic meta-level capability of an organisation to generate creative and effective responses to extant and emerging, present and potential challenges facing it, in an ongoing manner (Rastogi, 2000a,b);
- Individual knowledge stock of an organisation as represented by its employees (Bontis 2002); and

- Difference between company's market value and its book value, or the resources created from internal learning and development of valuable relationships (Pablos, 2003).

These definitions are at once neither mutually exclusive nor congruent. Table 1 (adapted and expanded from Bontis *et al.* 2000) provides a comparison of key conceptualisations, drawn from various authors in North America and Europe.

PUT TABLE 1 ABOUT HERE

The conceptualisations can be characterised in four broad categories:

- Human capital;
- Intellectual capital;
- Organisational capital; and
- Customer or relational capital.

Human capital and intellectual capital are the components with most in common (though the terminology differs). An examination of the detail underlying these two latter labels reveals differences in approach, with different mixes of qualitative and quantitative measures, and with differing emphases on head-count measures, financial measures, and non-financial measures of embodied attributes. In the other areas, despite some overlapping terminology, there is a wide range of reference to *organisational* characteristics, the way the organization 'does things' in terms of routines and structures, and *relational* characteristics, relating to the external market linkages with customers and suppliers. Edvinsson and Malone (1997) define intellectual capital as the sum of human capital and structural capital (hardware, software, databases, organisational structure, patents, trademarks and other organisational capabilities), as well as customer capital. Bontis *et al.* (2000) suggest that a convergence is starting to emerge with respect to what IC should include, especially in relation to human

capital, relational capital, organisational capital, although only in the narrow IC academic literature. For an overview of the debate, see Van der Meer-Kooistra and Zijlstra *et al.* (2001, p 459).

Others dispute that there is convergence (Canibano *et al.*, 2000). In any case, there are at least two bases on which the present situation is unsatisfactory for any widespread adoption. The first problem is a lack of comparability of the definitions and purposes of measurement across firms and over time. The second, and more fundamental, problem is the “hybrid” measurement basis for the broad classifications (and their detailed measures reviewed later in section 4), which tend to mix cost based measures with valuation concepts.

In relation to the second problem of the measurement basis, the acts of measurement (such as cost in monetary terms) and valuation (discounted present value of expected future dividends) are not the same thing. The former is grounded in actual transactions and events, while the latter relates to expected future inflows of net benefits (e.g., the discounted present value of the earnings able to be generated from the entity). The difference between the two represents the rate of return to the investment. We argue that the IC categories with their commonalities, and the vast array of indicator measures used to operationalise these broad categories (discussed in section 4), mix together cost measurement and valuation concepts. This “mix” is a hybrid that intermingles the (expected)⁵ net monetary *cost* of the firm’s

⁵ It is “expected” because accrual accounting is employed by companies not cash based accounting, and accrual accounting adds estimates of the monetary outcomes of incomplete transactions to the monetary cash inflows and outflows. Thus, accounting expenses for a particular accounting period, in general, are all those past, current and future cash outflows that were actually incurred from an “effort” perspective in that accounting period. Similarly, accounting revenues for a particular accounting period, in general, are all those past, current and future cash inflows that were actually earned from a “benefits” perspective in that accounting period. For example, a sale on credit of say \$6,000 generates a revenue in the accounting period of the sale of \$6,000, and a current “expected” cash receipt, termed an accounting receivable, which reflects expected cash receipt in a future period. Another example, a receipt of \$600 journal subscription monies in advance of delivery of the three-year subscription gives rise to a subscription liability until the “benefit” comprising the supply of the journals each year has been provided to the customer. As the journal (benefit or service) is provided, the company recognises a revenue (subscription revenue) that reduces the \$600 liability. Hence, cash increased when the subscription

investments and operations with the *value* expected to be derived in the future from intangible investment in such resources as training of employees, creating organization structures and routines, and building market share and customer and supplier networks. We argue this hybrid is not readily interpretable because it mixes the “accounting information inputs” with the managerial value concepts. Put another way, the hybrid tends to bring forward future value (or expected benefits) to the present by focusing on measurement of the firm’s intermediate output.

In relation to the problem of comparability, the definitions used by different authorities have commonalities in terminology but there is considerable scope for subjectivity in measurement and interpretation (section 4 gives a further sense of this subjectivity). None of the proposed classifications has met with general approval from the authorities. Some of the best-known schemes, like the Skandia Navigator, designed by Edvinsson (1997), are context-specific, limiting both comparisons over time and between organizations. All of the schemes are structured on the basis of statements about qualitative elements of expected future value, which are heterogeneous by definition, since each firm’s asset coalition is unique (Alchian 1984). For example, Bontis et al (2000) under *Structured Capital* refers to non-human assets, which presumably means physical and intangible production assets such as plant and equipment, and “organisational capabilities”.

Greater comparability could be achieved by means of a standard framework to establish measurement objectives to meet the interests of different parties: for example, existing and potential investors, management, or other stakeholders such as customers, suppliers, or employees. Interpretability and comparability would be enhanced by a more systematic

money was originally received. However, revenue is only recorded as the actual benefit (or service) is supplied to the customer, illustrating the point that accrual accounting measures monetary expectations.

analysis of relations among the key variables and their outcomes, defined in terms of some agreed measures of performance (such as earnings growth, growth in market value, growth in size and market share). As a first step, then, it seems important to assess exactly what are the motivations for the measurement of intangible capital.

3 Motivations for Measuring Intangible Capital

If measurement is to be undertaken (at a cost), it must serve some purpose of management, such as a tool of internal control, strategic development, or signalling future value to investors and shareholders. We can conjecture why firms would want to measure IC. For *internal* purposes, firms that measure IC would be better placed to manage their resources more efficiently and thereby minimise costs. For *external* purposes, firms that measure IC would have verifiable information available for signalling expected future growth of the firm to existing and potential investors and lenders who are interested in information inputs for valuation of the company. These conjectures suggest the purpose of IC measurement is to maximise company performance whether it be

- Maximising operating performance in generating revenues at the lowest cost;
- Maximising the sustainability of supplier and customer relations (i.e., market share); and/or
- Minimising the cost of the capital contributed by shareholders and lenders.

Putting on our research hats, we find little empirical evidence explaining why management want these “unofficial” IC metrics in practice. Table 2 provides a summary of the known literature surveying the firms’ internal and external motivations for measuring IC.

PUT TABLE 2 ABOUT HERE

Marr et al (2003) conducted a wide-ranging and systematic review of over 700 papers that examined issues to do with measurement of IC. From this review, they identify five purposes for measuring IC that dominate this literature

- To help organizations formulate their strategy;
- To assess strategy execution;
- To assist in diversification and expansion decisions;
- For use as a basis for compensation; and
- To communicate with external shareholders.

The first three of these purposes relate to internal decision making; in the parlance set out above, the purpose is maximising operating performance in generating revenues at the lowest cost and the sustainability of supplier and customer relations and market share. The fourth point relates to the executive incentive scheme, and the fifth relates to signalling motivations to external stakeholders. These disparate motivations have a common goal to engage the firm's resources in such a way to maximise earnings performance and the value of the firm's shares. Ultimately, evaluating these two quantities requires "hard" quantitative measures of money paid and money expected to be received. It is difficult to understand how, for example, a non-financial measure of the firm's human capital can shed useful insights on performance as described here. These seemingly disparate purposes of IC measurement highlight the lack of attention to specifying a fundamental purpose for IC. The disparate purposes also draw attention to the tension between "cost" (monetary) measures of IC and value-based measures that in some ways attempt to measure and, hence, bring the expected future performance forward (to the present). Moreover, it seems evident that although there may be some overlap, the indicators that operationalise the broad categories of IC will not be

identical: rather there is a need to separate out which indicators are relevant for different purposes.

In surveying other literature, a Danish survey found little evidence that managers were measuring IC to learn about the rate of return from investments. Instead, they found that the main *internal* motives for measuring IC were to support management's strategic direction and to promote the diffusion of knowledge. Since strategy and knowledge are critical foundations for future sustainable profits, these motives fit an operating performance purpose of measurement. The main *external* motivation was to use the IC metric to market the organisation by highlighting the entity's innovativeness and skilled resource base. This communication purpose is consistent with the speculated goal of maximising sustainable relations with external suppliers and customers and minimising the cost of capital.

According to the extant literature, and somewhat surprisingly given the anecdotal evidence that IC is an important component of investment, there are also disadvantages to measuring and reporting IC from the firm's perspective. Van der Meer-Kooistra *et al.* (2001) suggest these include cost, confidentiality, subjectivity, lack of standardisation, tax, the creation of undue expectations, and increased constraints on management. Do these disadvantages affect shareholder wealth (i.e., owners' wealth)? In general, the literature investigating the relationship between information disclosure and shareholders' wealth would give a resounding "no" to this question (e.g., Lang and Lundholm 1996; Barth and Clinch 1998; Richardson 2001). Disclosure of information about assets is positively associated with share price. Even uncertain information fits this category (e.g., Wyatt 2005). The known circumstances when more accounting disclosure about assets is a bad thing for shareholder

wealth is when the disclosures are ambiguous and/or the discloser lacks credibility (e.g., Healy and Palepu 1993).

We conjecture that the sources of these disadvantages of disclosure more likely arise from agency conflicts arising from the separation of ownership from management. There is a chronic agency problem (i.e., of management having opportunities to take perquisites and engage in activities such as empire building) when publicly owned corporations are managed by professional managers and the corporations' performance is also judged and reported by those same managers. It is well documented (theoretically and empirically) that the fundamental role of external financial reporting is to provide numbers to write and complete incentive contracts to control these tensions (Jensen and Meckling 1976; Watts and Zimmerman 1990). However, the tension lies in the fact that internal (monetary) information must first be identified and recorded under senior management's direction, before any accurate external reporting can take place. Exacerbating the tension is managements' reluctance to commit to transparent reporting of unobservable assets.⁶ In fact, executive management are "damned if they do and damned if they don't" because unregulated reporting on IC is more likely to be viewed with suspicion by financial analysts and investors. Consistent with this, a recent survey of financial reporting on intangible assets reveals that the "unofficial" IC metrics do not generally appear in financial reports (Hunter, Webster and Wyatt 2005) (i.e., terms such as "human capital", "organisational capital", "intellectual capital", and "customer and relational capital" are not used).

In conclusion, there are many motives for management engaging in IC measurement, but also a number of disincentives pulling in the opposite direction although how seriously

⁶ For example, in the Australian setting where reporting of intangible assets was possible until 2005, the average (median) proportion of total assets comprising intangible assets is only 10 percent (2 percent) over the 1993-1997 period (Wyatt 2005).

these should be taken, is an empirical issue that remains unaddressed. Measurement is undertaken both for internal purposes (strategic) and for external signalling purposes (optimism about future performance prospects). In the Arthur Andersen survey cited earlier, half the survey respondents believed that what was learned from the process of measurement was as useful as the information it delivered. This emphasises the early state of measurement in the IC area. Measurement that helps to improve strategic thinking by identifying intangible drivers of future value is important information for informing investors. The risk is that unless the purpose for measurement is clear, and the semantic links from the “measurement constructs” to the empirical measures are made clear, redundant, or irrelevant variables and “hybrid”, difficult to interpret measures, may be employed.

4 Practices in intangible capital metrics

Intellectual capital is not totally ignored by companies in preparing their financial accounting reports, and by definition, it must be to some extent identified in the management accounting system within the firm (i.e., as costs). As illustrated in Table 3, and reproduced from Wyatt (2005), external financial reporting involves mainly separable type intangible assets. The assets in Table 3 are primarily measured on a cost basis.

PUT TABLE 3 ABOUT HERE

The financial statements do not report on the total expenditures allocated to intangible investment and there is no existing taxonomy of intangible investments or intangible assets (or expenses). This is evident from the ad hoc categories of intangible assets presented in the Table 3. Some companies recognise purchased IC components (acquired as part of an acquisition of another company or business) through their financial statements (e.g., brands,

trademarks). As has been the case in Australia for many years since the issue of AASB 1015 Acquisitions of Assets, the United States accounting standard, FAS 141 Business Combinations (2001) seeks to increase the recognition of acquired only intangible assets. The accounting standard mandates the recognition of purchased IC items, which are separable (from the enterprise) or arise from contractual or other legal rights. This approach relies on an exchange transaction to establish the verifiability and, hence, existence of the recognised asset, and only refers to externally acquired items. This approach has been very stringently adopted in the International Financial Reporting Standards, IAS 38 Intangible Assets, whose equivalent, AASB 138 Intangible Assets, came into effect for reporting periods beginning after 1 January 2005 for all Australian disclosing and reporting entities (see Statement of Accounting Concept 1 Definition of the Reporting Entity and Part 2M.3 of the Corporations Act 2001). This accounting standard (i.e., the international standard, IAS 38, and Australian equivalent, AASB 138) will result in most internally generated intangible assets being removed from the balance sheets of Australian companies on adoption of the standard, and very limited new recognition of internally generated intangible assets.

Thus, we conclude that the approach of the external financial reporting framework does little to reflect management's *intent* in deciding to allocate expenditures to intangible investment that are intended to put the firm in a position to generate future benefits. Nor does it advance the technology for measuring intangible variables that companies might see as critical to their competitive strategy and longer-term profit prospects.

Turning to the internal information systems, there is survey evidence that enterprises are using non-financial IC metrics. According to a University of Melbourne business survey, approximately 90 per cent of 634 large Australian organisations responding to the survey

instrument are computing at least some non-financial IC metrics as part of their internal management systems (Melbourne Institute Business Survey 2001-2003, IBISWorld database). As shown in Table 4, some enterprises are undertaking customer and employee satisfaction and retention measures, organisational knowledge management performance measures, and community and other stakeholder satisfaction measures.

TABLE 4 ABOUT HERE

Supporting evidence was drawn from an Arthur Andersen direct mail survey (1998) of 368 international companies. The Andersen's survey suggests that some measurement was going on in 75 per cent of the sample. However, the general conclusion from this survey is that IC would not appear on financial balance sheets in the near future in any systematic and regulated format; instead, any external IC reporting would be voluntary. Any IC measurement was viewed as being useful mainly for internal management than as a basis of communication to shareholders (Arthur Andersen 1998: cited in Bontis et al 2000, 6).

A small number of companies have adopted sets of measures and indicators of what IC seem important in their particular business model, which is reported to shareholders in the form of an IC statement supplementary to the financial accounts. The most prominent example is Skandia, which first issues a supplementary IC report in 1994, the architect for which was Edvinsson (1997). Dow Chemicals is another much quoted example, building on Skandia's conceptualisation to value its own R&D and patent process. There is no known evidence on the usefulness of these IC disclosures incrementally to regulated external reporting requirements.

Other surveys have been conducted to assess what companies are doing for internal reporting purposes (that is, to manage their IC). These surveys suffer from very low response

rates (and high response biases), but are consistently interpreted as firms doing little in terms of implementing IC measurement and management strategies (e.g., Pablos 2003; Darroch and McNaughton, 2003; St Leon 2002). Most of the literature investigating measurement issues is focused on the external reporting to equity investors and financial analysts. This literature presents robust evidence that this information is associated with stock price, changes in stock price, future stock price in some cases, and future earnings. This evidence is robust across all types of separable intangible assets (the “types” observed are illustrated in table 3) generally measured in monetary units (Wyatt 2005). Intangible assets that have been tested for this relationship include research and development, patents, brands and trademarks, customer satisfaction, and human resources.⁷ Researchers have generally been unable to derive financial measures of many intangible assets, such as the quality of human resources and the level of customer satisfaction. Moreover, Hunter, Webster and Wyatt (2005) provide evidence that these latter types of non-financial “measures” do not generally appear in financial reports.

A growing number of academics and consultants have engaged in the promulgation and promotion of IC metrics in the context of knowledge management, intellectual capital, and human resource accounting. In fact, there are hundreds of consultants offering IC consulting services⁸, a sample of which is provided in Table 5, indicating the perceived demand.

⁷There is substantial research from the empirical literature that relations exist between enterprise market value and a range of internal expenditures and external purchases of intangibles including: R&D expenditure [See Ben-Zion (1984), Ben Zion (1978); Griliches (1981); Hirschey (1982); Jaffe (1986); Ettredge and Bublitz (1988); Bublitz and Ettredge (1989); Hall and Hayashi (1989); Chan, Martin and Kensinger (1990); Connolly and Hirschey (1990); Griliches, Hall and Pakes (1991); Shevlin (1991); Hirschey and Spencer (1992); Hall (1993); Johnson and Pazderka (1993); Megna and Klock (1993); Chauvin and Hirschey (1993); Sougiannis (1994); White (1995); Lev and Sougiannis (1996); Deng and Lev (1997); Stoneman and Toivanen (1997); Hirschey and Richardson (1998); Aboody and Lev (1998)]; patents [Griliches, Pakes and Hall (1987); Austin (1993); Shane (1993); and, Jaffe, Fogarty and Banks (1997)], brands and trademarks [Seethamraju (2000), and Barth, Clement, Foster and Kasznik (1998)]; customer satisfaction [Banker, Potter and Srinivasan (1998); Anderson, Fornell and Lehmann (1997); Foster and Gupta (1997); and Ittner and Larcker (1998)]; human resources [Hansson (1997); Huselid (1999); and, Hand (1998)], purchased goodwill (see Clinch 1995); and advertising expenditures (for which valuation effects arise only for expenditures on the promotion of non-durable goods) (Hirschey and Weygandt 1985, p. 331).

⁸ Source: http://www.valuebasedmanagement.net/consultants_vbm.html

PUT TABLE 5 ABOUT HERE

Table 5 provides a brief summary of the major proponents, their approach, type of service offered, and an indication of the proponents' transparency in revealing public information about their approach to IC measurement. This information was collected from searches of financial publications, academic publications, and the proponents' internet sites.

A close reading of Table 5 indicates that the focus of many consultants is knowledge management services (KM services). The most visible players are specialist "intellectual capital" consulting firms, which have spawned from pioneering academics (e.g., Sveiby, Edvinsson, Steward, Allee and others) or Nordic companies with a strong emphasis on knowledge management (e.g., Randoll, Skandia).⁹ These services may involve an IC measurement component. IC measurement approaches offered by consultants most commonly involve the use of indices (e.g., human resource related information, or survey opinions), which are benchmarked (over time or against competitors) or used as the bases for KM services.

Of the 39 consultancies reviewed from their public disclosures, those indicating they work from a framework use a set of categories broadly similar to (but sometimes varying in nomenclature from) the four general components set out in Section 2 (human capital intellectual capital, organisational capital and relational capital). Table 5 is instructive in other

⁹ For example, some of the 'branded' IC metrics that currently exist include: Intangible Asset Monitor (Sveiby, 1997), Balanced Scorecard (Kaplan and Norton, 1992), IC-dVAL (Bounfour, 2003), Intellectual Capital Web (Zhou *et al.*, 2003a, b), Scaling (Cinca *et al.*, 2003), Value Creation Index (Funk, 2003, Kalafut and Low, 2001), European Performance Satisfaction Index (Eskildsen, 2003), European Employee Index (Eskildsen *et al.*, 2003), FiMIAM (Rodov and Leliaert, 2002), and IC-3 dimensional scaling (Edvinsson, 2000).

ways. Although it is difficult to obtain meaningful public data, what we have uncovered suggests that

- At least ten consultants operate as generalist advisers;
- Four consultants have an area of specialisation such as legal aspects;
- Nine consultants are involved in knowledge management consultancy; and
- A further ten appear to be specialised in valuation, using proprietary methods such as Value-Based Management (VBM) or EVA™.

There is a division between those pursuing a financial valuation approach (the VBM specialists) and those adopting a “scorecard” approach (which may or may not contain some financial measures). The scorecard derives from the Kaplan and Norton (1992, 1996) balanced scorecard conceptualisation, which was not designed as a measure of IC. Rather, the scorecard was intended as a strategic tool that would broaden the perspective from financial considerations to encompass innovation and learning, customer relationships and internal business processes. Table 5 indicates that a sizeable proportion of consulting organizations have adopted variations of discounted cash flow and earnings based methods to attempt to value IC. However, there is little doubt that the trend has been in the direction of the scorecard approach, both in the general IC field and in the more specific area of knowledge management. The scorecard cannot measure the monetary allocation to IC investments since it is not expressed in financial terms but rather in a battery of indicators.

There are commonalities of terminology evident in Table 5. There is also an absence of a common framework for IC accounting at the level of the enterprise. Instead, the individuals and/or organizations offering IC measurement, featuring in table 4, provide their own unique

“tool” and appear to have different purposes of measurement. Business consultants and academics have obviously observed the demand for a market in IC measurement and have moved in to offer a variety of services, including valuation, intangibles analysis for strategic development purposes, knowledge management, and training. One effect of this has been to draw more companies into the field of active IC management, following the differentiated templates of competing consulting organizations, sometimes trademarked and sometimes protected as business secrets (prominent activists include Sveiby, Edvinsson, Stewart, and Allee). A variant on this is the Danish Ministry of Science, Technology and Innovation, which supported a team lead by Mouritsen in the production of a Guideline for IC in 2000, which was field tested in approximately 100 Danish firms in the following year, leading to a revised Guideline (Danish Ministry of Science, Technology and Innovation, 2003). While this might provide a basis for greater consistency and standardisation among consulting organizations that embrace the guideline, the hybrid monetary/“value” measurement approach is problematic as identified earlier in section 2.

Table 6 provides descriptive evidence on the actual metrics that consultants and academics are employing to deliver their “services”.

PUT TABLE 6 ABOUT HERE

Table 6 is organised around seven categories of indicators. In addition, each of the metrics within these categories is classified according to the following sub-groups

- cc=customer capital;
- hc=human capital;
- rc =relational capital;
- sc=structural capital;
- er=external relationships;
- is=internal structure;

- c=competence;
- ff=financial focus; and
- ve=value extraction.

One of the main difficulties with these measures is that we cannot tell whether they represent a sum of the effort the firm put in to create the asset, or an estimate of each item's contribution to (future) profits. In addition, all of the sub-groups except the last two are essentially qualitative attributes of the firm and by definition, therefore, heterogeneous and non-comparable. There are some interesting indicators that would be expected to be closely linked to specific aspects of the firm's capacity for favourable future performance, for example, alliances with business schools for consulting firms needing to attract highly trained employees. However, overall the indicators are voluminous in number, heterogeneous in nature, and therefore non-standard and not comparable across firms and over time. To take just one example by way of illustration: the R&D indicators across the six consultants contain 27 indicators. Only two of these are common to at least three consultants and most are specific to one consultant only. A similar pattern holds throughout the various categories of Table 7.

In summary, the batteries of indicators make components of intellectual capital "visible" but not in a form, on average, that is informative about monetary allocations to IC investments, or that could lend itself to relative rate of return statistics from the different types of IC investments. Moreover, the indicators are not comparable (across years, segments or firms) because a standard definition and common framework (and understanding) has so far not emerged. Our descriptive review of public information sources suggests two types of problems. The first is disagreement among the protagonists about whether a generic list of indicators is appropriate or whether it is preferable to select indicators according to the

organisation and its objectives. The latter view challenges the prospect of standardisation across firms. Without making too strong an inference, the available data on IC measurement practices suggests the need for a business model to drive the measurement process that incorporates the firm's strategy, business processes, and external environment effects. Secondly, many of the specific indicators proposed and implemented are based on implicit hypotheses with respect to their effect on the level of expected earnings and earnings (or market value of equity) growth. However, there is a lack of substantive evidence consistent with a causal link to performance. This evidence is lacking primarily due to problems deriving semantically valid measures from outside "non-cost" sources.



We conclude this section by turning back to consider "costs" as an alternative to the "valuation" (future benefits) orientation of many of the IC metrics (as illustrated in table 6). Cost is criticised as backwards looking. However, costs for incomplete transactions are actually verifiable forward-looking information. "Costs" are management decisions, so focusing on costs focuses on managements' intentions. When management intend expenditures as intangible investments rather than costs of doing business this fiscal year, then there is a capital investment. The appropriate evaluation of successful investment decisions is to track the investment costs (e.g., in employee skills) against the future benefits from deploying the investment (i.e., the employees' services in the business). Strategic intent thus determines whether an allocation of resources was originally (intended) as an expense of the period or an investment with long-lived benefits. For example, management of a pharmaceutical company budgets 8 per cent of sales to basic research which on average is viewed as a sunk cost and treated as a period expense (i.e., a cost of operations); and management budgets 20 percent of sales as an investment in the development of products in

the pipeline. Whether or not the investment provides a good return in the future will determine whether or not it was a good or a bad investment. The point is that it is “poor” accounting, including “poor” performance measurement and management accountability, to treat and evaluate the “development investment” as an expense. There is a problem with too many Type I errors. Management, analysts, and investors will not know how well the investment has fared until they have a cost-based measure of the investment that can be pitted against the future benefits generated. Focusing on management intent brings us back to the economic definition of an investment, an expenditure intended to have long-term benefits.

5 Conclusion

This paper argues that the approaches and “unofficial” metrics which have been developed to fill the error in the “official” information systems have limited scope for widespread usage. The batteries of IC indicators, which have been privately proposed, make components of intellectual capital “visible”. However, we have argued that this IC information is not consistent, comprehensive or reliable, nor is it informative about the relative monetary allocations to different categories of IC investments. Furthermore, since it is generally not clear whether these non-financial indicators are reflections of the activity (cost) expended to generate the asset, or represent forward-looking values to the firm, there are no all-purpose ways to use the data analytically.

Official accounting standards are misconceived if they believe that a “conservative” approach is prudent and minimises information errors. The existing rules seek to minimise Type II errors but completely overlook the consequent implications for Type I error. Moreover, given the rising significance of intangible capital in firms over the past half

century,¹⁰ the magnitude of the Type I error is expected to grow. The objective of the accounting decision should be to optimise – that is minimise – combined errors, not a single error.

It is fundamental that a cost based measure of IC relies upon what is agreed in the literature to be the dominant strategic intent of the expenditure. The rate of return to this investment can only be determined through an analysis involving the original expenditure data. Much of what takes place under existing approaches is concerned with measuring the expected future value of the firm's intermediate output rather than the firm's original monetary allocations to IC investments of different types. The main conclusion of the paper is therefore to suggest that the way forward to a standardised, more comparable approach to measuring IC is to employ a back to basics "costs" approach which classifies investments in intangible capital as assets based on management intent at the time the investments are made. Finally, it is implicit in our argument that a mandatory framework is necessary to motivate firms to participate.

¹⁰ This has been documented in Webster (1999).

References

- Aboody, D., and B. Lev, 1998, "The Value Relevance of Intangibles: The Case of Software Capitalisation", *Journal of Accounting Research* 36: 161-191.
- Alchian, A., 1984, "Specificity, Specialisation, and Coalitions", *Journal of Institutional and Theoretical Economics* 140, 1: 34-49.
- Allee, V., 2000, "The Value Evolution – addressing larger implications of an intellectual capital and intangibles perspective", *Journal of Intellectual Capital* 1, 1: 17- 32.
- Anderson, E., C. Fornell, and D. Lehmann, 1994, "Customer Satisfaction, Market Share and Profitability: Findings from Sweden", *Journal of Marketing Research* 58: 53-66.
- April, K.A., P. Bosma, and D. A. Deglon, 2003, "IC Measurement and Reporting: Establishing a Practice in SA Mining", *Journal of Intellectual Capital* 4, 2: 165- 180.
- Austin, D., 1993, "An Event Study Approach to Measuring Innovative Output: The Case of Biotechnology", *American Economic Review* 83: 253-258.
- Banker, R., G. Potter, and D. Srinivasan, 1998, "An Empirical Investigation of an Incentive Plan Based on Non-Financial Performance Measures", Working Paper, University of Texas.
- Barth, M., and G. Clinch, 1998, "Revalued Financial, Tangible and Intangible Assets: Association with Share Prices and Non-Market-Based Value Estimates", *Journal of Accounting Research* 36: 199-233.
- Barth, M., M. Clement, G. Foster, and R. Kasznik, 1998, "Brand Values and Capital Market Valuation", *Review of Accounting Studies* 3: 41-68.
- Beaver, W. H., 1998, *Financial Reporting – An Accounting Revolution*, Third Edition, Prentice Hall Contemporary Topics in Accounting Series, New Jersey.
- Ben Zion, U., 1978, "The Investment Aspect of Nonproduction Expenditures: An Empirical Test", *Journal of Economics and Business*, Spring-Summer: 224-229.
- Ben-Zion, U., 1984, "The R&D and Investment Decision and its Relationship to the Firm's Market Value: Some Preliminary Results", in Z. Griliches (editor), *R & D, Patents and Productivity*, University of Chicago Press, Chicago and London: 299-314.
- Bontis, N., 2002, "Intellectual Capital Disclosure in Canadian Corporations" unpublished. Available at: <http://www.business.mcmaster.ca/mktg/nbontis/research.htm>.
- Bontis, N., W. C. C. Keow, and S. Richardson, 2000, "Intellectual Capital and Business Performance in Malaysian Industry", *Journal of Intellectual Capital* 1, 1: 85- 100.
- Boone, J. P., and K. K. Raman, 1999, "Unrecognized R&D Assets and the Market Microstructure", Working Paper, Mississippi State University.
- Bounfour, A., 2003, "The IC-dVAL approach", *Journal of Intellectual Capital* 4, 3: 396–413.
- Brooking, A., 1996, *Intellectual Capital – Core Asset for the Third Millennium Enterprise*, International Thomson Business Press, London.
- Bublitz, B., and M. Ettredge, 1989, "The Information in Discretionary Outlays: Advertising, Research, and Development", *The Accounting Review* 64: 108-125.

- Canibano, L., M. Garcia-Ayuso, and P. Sanchez, 2000, "Accounting for Intangibles: A literature review", *Journal of Accounting Literature* 19: 102- 130.
- Celemi Annual Report, 2002, Available at:
www.celemi.com/about/news/pdf/Annual%20Report%202002.pdf.
- Chan, S. H., J. Martin, and J. Kensinger, 1990, "Corporate Research and Development Expenditures and Share Value", *Journal of Financial Economics* 26: 255-276.
- Chauvin, K. W., and M. Hirschey, 1993, "Advertising, R&D Expenditure and the Market Value of the Firm", *Financial Management* 22: 128-140.
- Cinca, C.S., M. M. Cecilio, and A. B. Queiroz, 2003, "The Measurement of Intangible Assets in Public Sector Using Scaling Techniques", *Journal of Intellectual Capital* 4, 2: 249-276.
- Clinch, G., 1995, "Capital Markets Research and the Goodwill Debate", *Australian Accounting Review*, May: 22-30.
- Connolly, R. A., and M. Hirschey, 1990, "Firm Size and R&D Effectiveness: A Value-Based Test", *Economics Letters* 32: 277-281.
- Danish Ministry of Science Technology and Innovation, 2003, "Intellectual Capital Statements – The New Guideline", Denmark. Available at:
http://www.videnskabsministeriet.dk/fsk/publ/2003/guideline_uk/guideline_uk.pdf.
- Darroch J., and R. McNaughton, 2003, "Beyond Market Orientation: Knowledge Management and the Innovativeness of New Zealand Firms", *European Journal of Marketing* 37, 3-4: 572-593.
- Deng, Z., and B. Lev, 1998, "The Valuation of Acquired R&D", Working Paper, Stern School of Business, New York University.
- Edvinsson, L., 1997, "Developing Intellectual Capital at Skandia", *Long Range Planning* 30, 3: 366-373.
- Edvinsson, L., and M. S. Malone, 1997, *Intellectual Capital: Realizing Your Company's True Value by Finding Its Hidden Brainpower*, 1st edition, Harper Collins Publishers, New York, NY.
- Eskildsen, J. K., K. Kristensen, and A. H. Westlund, 2003, "The Predictive Power of Intangibles", *Measuring Business Excellence* 7, 2: 46-54.
- Ettredge, M., and B. Bublitz, 1988, "A Reexamination of Market-Assessed Intangible Assets: Advertising and R&D", Unpublished Manuscript.
- Financial Accounting Standards Board, FAS 141 *Business Combinations*, 2001.
- Foster, G., and M. Gupta, 1997, "The Customer Profitability Implications of Customer Satisfaction", Working Paper: Stanford University.
- Funk, K., 2003, "Sustainability and Performance", *MIT Sloan Management Review* 44, 2: 67-74.
- Griliches, Z., 1981, "Market Value, R&D and Patents", *Economics Letters* 7: 183-187.
- Griliches, Z., 1990, "Patent Statistics as Economic Indicators: A Survey", *Journal of Economic Literature* XXVIII: 1661-1707.

- Griliches, Z., B. H. Hall, and A. Pakes, 1991, "R&D, Patents, and Market Value Revisited: Is There a Second (Technological Opportunity) Factor?", *Economics of Innovation and New Technologies* 1: 183-201.
- Griliches, Z., A. Pakes, and B. H. Hall, 1987, "Patents as Indicators of Inventive Activity", in P. Dasgupta and P. Stoneman, *Economic Policy and Technological Performance*, Cambridge University Press, Cambridge, New York, New Rochelle, Melbourne, Sydney: 97-121.
- Guthrie, J., R. Petty, and U. Johanson, 2001, "Sunrise in the Knowledge Economy – Managing, Measuring and Reporting Intellectual Capital", *Accounting, Auditing and Accountability Journal* 14, 4: 365- 382.
- Hall, B., 1993, "The Stock Market's Valuation of R&D Investment During the 1980s", *American Economic Review* 83: 259-264.
- Hall, B., and F. Hayashi, 1989, "Research and Development as an Investment", University of California at Berkeley Economics Working Papers.
- Hand, J., 1998, "Does CEO Human Capital Make a Difference?", Working Paper, University of Carolina.
- Hansson, B., 1997, "Personal Investments and Abnormal Returns: Knowledge-Based Firms and Human Resource Accounting", *Journal of Human Resources, Costing and Accounting* 2, 2: 2-29.
- Healy, P. M., and K. G. Palepu, 1993, "The Effect of Firms' Financial Disclosure Strategies on Stock Prices", *Accounting Horizons* 7, 1: 1-11.
- Hirschey, M., 1982, "Intangible Capital Assets of Advertising and Research and Development Expenditure", *Journal of Industrial Economics* 30: 175-90.
- Hirschey, M., and J. Richardson, 1998, "Value Relevance of Nonfinancial Information: The Case of Patent Data", Working Paper: University of Kansas, Kansas.
- Hirschey, M., and R. S. Spencer, 1992, "Size Effects in the Market Valuation of Fundamental Factors", *Financial Analysts Journal* 48: 91-95.
- Hirschey, M., and J. J. Weygandt, 1985, "Amortisation Policy for Advertising and Research and Development", *Journal of Accounting Research* 23: 326-335.
- Hunter, L. C., E. Webster, and A. Wyatt, 2005, "Measuring Intangible Investment", Melbourne Institute Working Paper, University of Melbourne.
- Huselid, M., 1999, "Human Resources, Knowledge Management and Firm's Performance", Working Paper, Rutgers University.
- Ittner, C. D., and D. F. Larcker, 1998, "Are Non-Financial Measures Leading Indicators of Financial Performance? An Analysis of Customer Satisfaction", *Journal of Accounting Research* 36: 1-46.
- Jaffe, A. B., 1986, "Technological Opportunity and Spillovers of R & D: Evidence from Firms' Patents, Profits, and Market Value", *American Economic Review* 76: 984-1001.
- Jaffe, A. B., M. S. Fogarty, and B. A. Banks, 1998, "Evidence from Patents and Patent Citation On the Impact of NASA and Other Federal Labs on Commercial Innovation", *Journal of Industrial Economics* XLVI: 183-205.

- Jensen, M., and W. Meckling, 1976, "Theory of the Firm: Managerial Behaviour, Agency Costs and Ownership Structure", *Journal of Financial Economics* 3: 305-360.
- Johanson, U., M. Martensson, and M. Skog, 2001a, "Measuring to Understand Intangible Performance Drivers", *European Accounting Review* 10, 3: 407-437.
- Johanson, U., M. Martensson, and M. Skog, 2001b, "Mobilizing Change Through the Management Control of Intangibles", *Accounting, Organizations and Society* 26, 7: 715-733.
- Johnson, L. D., and B. Pazderka, 1993, "Firm Value and Investment in R&D", *Managerial and Decision Economics* 14: 15-24.
- Kalafut, P.C., and J. Low, 2001, "The Value Creation Index: Quantifying Intangible Value", *Strategy and Leadership* 29, 5: 9-15.
- Kaplan, R. S., and D. P. Norton, 1996, *The Balanced Scorecard. Translating Strategy into Action*, Harvard Business School Press, Boston, Massachusetts.
- Kaplan, R.S., and D. P. Norton, 1992, "The Balanced Scorecard - Measures that Drive Performance", *Harvard Business Review* 70: 72-9.
- Kaplan, R.S., and D. P. Norton, 1996, "Using the Balanced Scorecard as a Strategic Management System", *Harvard Business Review*, January-February: 75-85.
- Klein, D.A., and L. Prusak, 1994, "Characterizing Intellectual Capital", Center for Business Innovation, Ernst & Young LLP.
- Lang, M. H., and R. J. Lundholm, 1996, "Corporate Disclosure Policy and Analyst Behaviour", *The Accounting Review* 71, 4: 467-492.
- Lev, B., 2001, *Intangibles, Management, Measurement and Reporting*, Brookings Institute Press, Washington DC.
- Lev, B., and T. Sougiannis, 1996, "The Capitalisation, Amortisation and Value Relevance of R&D", *Journal of Accounting and Economics* 21: 107-138.
- Marr, B., D. Gray, and A. Neely, 2003, "Why Do Firms Measure their Intellectual Capital?", *Journal of Intellectual Capital* 4: 441-464.
- Megna, P., and M. Klock, 1993, "The Impact of Intangible Capital on Tobin's Q in the Semiconductor Industry", *American Economic Review* 83: 265-269.
- Ohlson, J., 1995, "Earnings, Book Values and Dividends in Security Valuation", *Contemporary Accounting Research* 11, Spring: 661-668.
- Pablos, P.O.D., 2002, "Evidence of Intellectual Capital Measurement from Asia, Europe, and the Middle East", *Journal of Intellectual Capital* 3, 3: 287- 302.
- Pablos, P.O.D., 2003, "Intellectual Capital Reporting in Spain: A Comparative View", *Journal of Intellectual Capital* 4, 1: 61- 81.
- Rastogi, S., 2000a, "Knowledge Management and Intellectual Capital – The New Virtuous Reality of Competitiveness", *Human Systems Management* 19, 1: 39 -49.
- Rastogi, S., 2000b, "Sustaining Enterprise Competitiveness – is Human Capital the Answer?", *Human Systems Management* 19, 3: 193-204.
- Richardson, S., 2001, "Discretionary Disclosure: A Note", *Abacus* 37, 2: 233-247.

- Roberts, H., and C. Chaminade, 2003, "What it Means is What it Does: A Comparative Analysis of Implementing Intellectual Capital In Norway and Spain", *European Accounting Review* 12, 4: 733-751.
- Rodov, I., and P. Leliaert, 2002, "FiMIAM: Financial Methods of Intangible Assets Measurement", *Journal of Intellectual Capital* 3, 3: 323-337.
- Roos, J., G. Roos, L. Edvinsson, and N. C. Dragonetti, 1997, *Intellectual Capital: Navigating in the New Business Landscape*, New York University Press, New York.
- Seethamraju, C., 2000, "The Value-Relevance of Trademarks", Working Paper, New York University.
- Shane, H., 1993, "Patent Citations as an Indicator of The Value of Intangible Assets in the Semiconductor Industry", Working Paper, University of Pennsylvania.
- Shevlin, T., 1991, "The Valuation of R&D Firms with R&D Limited Partnerships", *The Accounting Review* 1, 66: 1-21.
- Skandia, 1996, "Customer Value", Supplement to Skandia's 1996 Annual Report.
- Sougiannis, T., 1994, "The Accounting Based Valuation of Corporate R&D", *The Accounting Review* 1: 44-68.
- St Leon, M., 2002, "Intellectual Capital – Managerial Perceptions of Organisational Knowledge Resources", *Journal of Intellectual Capital* 3, 2: 149- 166.
- Starovic, D., and B. Marr, 2003, "Understanding Corporate Value: Managing and Reporting Intellectual Capital", CIMA, London.
- Stewart, T. A., 1997, *Intellectual Capital, The New Wealth of Organizations*, Doubleday, New York, NY.
- Stoneman, P., and O. Toivanen, 2001, "The Impact of Revised Recommended Accounting Practices on R&D Reporting by UK Firms", *International Journal of the Economics of Business* 8: 123-136.
- Sullivan, P. H., 2000, *Value Driven Intellectual Capital, in How to Convert Intangible Corporate Asset into Market Value*, John Wiley, United States.
- Tayles, M., A. Bramley, N. Adshead, and J. Farr, 2002, "Dealing with the Management of Intellectual Capital: The Potential Role of Strategic Management Accounting", *Accounting, Auditing and Accountability Journal* 15, 2: 251-268.
- Van der Meer-Kooistra, J., and S. M. Zijlstra, 2001, "Reporting on Intellectual Capital", *Accounting, Auditing and Accountability Journal* 14, 4: 456- 476.
- VMIA Value Management Inc. Available at:
http://www.valuebasedmanagement.net/consultants_vbm.html
- Watts, R. L., and J. L. Zimmerman, 1990, "Positive Accounting Theory: A Ten Year Perspective", *The Accounting Review* 65, 1: 131-156.
- Webster, E., 1999, *The Economics of Intangible Investment*, Edward Elgar Publishing Limited, United Kingdom.
- Webster, E., 2004, "Firms' Decisions to Innovate and Innovation Routines", *Economics of Innovation and New Technology* 13, 8: 733-45.

- White, F. C., 1995, "Valuation of Intangible Capital in Agriculture", *Journal of Agricultural and Applied Economics* 27: 437-445.
- Wyatt, A., 2005, "Accounting Recognition of Intangible Assets: Theory and Evidence on Economic Determinants", Forthcoming, *The Accounting Review*, July.
- Zambon, S., and M. Cordazzo, 2002, "IC Statements vs. Environmental and Social Reports: An Empirical Analysis of their Convergences in the Italian Context", Working Paper, University of Ferrara.
- Zhou, A. Z., 2003a, "Knowledge Management and Intellectual Capital: An Empirical Examination of Current Practice in Australia", *Knowledge Management Research and Practice* 1, 2: 86-94.
- Zhou, A. Z., 2003b, "The Intellectual Capital Web: A Systematic Linking of Intellectual Capital and Knowledge Management", *Journal of Intellectual Capital* 4, 1: 34-48.

Table 1 Summary of Classifications used for Intangible Capital Employed by Major Players in IC Measurement

Brooking (1996) (UK)	Roos, Roos & Edvinsson (1997) (UK)	Stewart (1997) (USA)	Bontis et al (2000) (Canada)	Sveiby (1997) (Sweden)	Edvinsson and Malone (1997) (Denmark)	New Guideline (2003) (Denmark)	Allee (2000) (US)
<i>Human-centred assets</i> Skills, abilities, expertise, problem solving abilities and leadership styles, the embodied knowledge of the workforce	<i>Human capital</i> Competence, attitude and intellectual agility	<i>Human capital</i> Employees are an organisation's most important asset	<i>Human capital</i> The individual-level knowledge that each employee possesses	<i>Human capital</i> Employee know-how, education & quals, work-related knowledge & competency, entrepreneurial spirit	<i>Human capital</i> Competence matrix. Number of professionals, total staff, temps	<i>Employees</i> Employees' skills, competencies, experience, education, motivation, commitment.	<i>Human capital</i> Competence Individual capabilities, knowledge, skills, experience and problem solving abilities that reside in people.
<i>Infrastructure assets</i> All the technologies, processes, routines, organisational structures, internal information networks, m'ment methodologies	<i>Organisational capital</i> All organisational, innovation, processes, intellectual property and cultural assets	<i>Structured capital</i> Knowledge embedded in information technology.	<i>Structured capital</i> Non-human assets or organisational capabilities used to meet market requirements	<i>Internal capital</i> M'ment philosophy, Corporate Culture, m'ment processes, Information & networking systems, financial relations, IP	<i>Process capital</i> Average throughput time of invoicing. Average throughput of monthly reporting	<i>Processes</i> Knowledge embedded in stable procedures., innovation processes quality procedures, m'ment & control processes, mechanisms for handling info.	<i>Corporate identity</i> Value of one's vision, purpose, values, ethical stance and leadership
<i>Market assets</i> Brands, customers, customer loyalty and distribution channels, relations and networks with stakeholders, and also wider social citizenship and environmental health investments.	<i>Relational capital</i> Relationships which include internal and external stakeholders	<i>Customer capital</i> Market information used to capture and retain customers	<i>Relational capital</i> Customer capital is only one feature of the knowledge embedded in organisational relationships	<i>External capital</i> Brands Customers, customer loyalty Company names Distribution channels Business collaborations Licensing agreements Favourable contracts Franchising agreements	<i>Customer capital</i> Service-based sales spread. Percentage of key clients	<i>Customers</i> Customer mix; relations to customers and users, their satisfaction and loyalty, their referral of the company; insight into users' and customers' needs and the degree of co-operation with customers and users in product and process development	<i>External relationships</i> Business relationships with customers, strategic partners, suppliers, investors, etc Quality relationships enjoyed with larger society Relationship with earth and resources and contribution to health and sustainability of environment

Brooking (1996) (UK)	Roos, Roos & Edvinsson (1997) (UK)	Stewart (1997) (USA)	Bontis et al (2000) (Canada)	Sveiby (1997) (Sweden)	Edvinsson and Malone (1997) (Denmark)	New Guideline (2003) (Denmark)	Allee (2000) (US)
<i>Intellectual property</i> Patents, trade marks, copyright, reg. designs, legal protection of confidential information etc.	<i>Renewal and development capital</i> New patents and training efforts.	All patents, plans and trademarks.	<i>Intellectual property</i> Unlike IC, IP is a protected asset and has a legal definition		<i>Innovation capital</i> Current innovation areas; staff deployable in these areas	<i>Technologies</i> Technological support of the other three knowledge resources. IT systems esp. intensity usage.	<i>Internal structure</i> Systems & processes that leverage competitiveness, incl. ICT, databases, documents, IP

Table 2 Reviews of Motivations for Measuring Intangible Capital

<i>Internal Measurement Purposes</i>	<i>External Measurement Purposes</i>
<p>What is measured is managed. Several surveys of practice suggest management believes the failure to incorporate IC will result in sub-optimal business decisions but do not develop the linkages by which the sub-optimal decisions (or optimal decisions) will be facilitated <i>(Darroch et al. 2003, Caddy 2000 in Guthrie 2001, Van der Meer-Kooistra et al. 2001).</i></p> <p>A survey of approximately 30 Danish companies was undertaken by the Danish Ministry of Science, Technology, and Innovation as part of the development of this body's, The New Guideline. The survey suggests that companies had the following internal IC measurement objectives:</p> <ul style="list-style-type: none"> • support strategy (95%) • ensure knowledge updates (90%) • ensure knowledge sharing (90%) • implement systematic knowledge management (85%) • identify control indicators (80%) • management and recording of competencies (80%) • creating innovation (80%). <p>(note that interpretation of this survey is subject to self selection bias) <i>(Danish Ministry of Science, Technology, and Innovation as part of the development of this body's, The New Guideline, 2003.)</i></p> <p>Several academic studies suggest the importance of IC statements for internal management of resources purposes <i>(Johanson et al. 2001a, b; Roberts et al. 2003; Tayles et al. 2002)</i></p> <p>A review of over 700 papers studying IC measurement related issues finds five themes in the purpose of measuring IC: -to help organizations formulated their strategy -to evaluate strategy execution -to assist in the firm's diversification and expansion decisions -for use as a basis for management compensation -to communicate with shareholders <i>Marr et al (2003)</i></p>	<p>A tool for attracting financiers. A survey of approximately 30 Danish companies in the course of developing The New Guideline (Danish Ministry of Science, Technology and Innovation), suggests that companies had the following external IC measurement objectives (note that interpretation of this survey is subject to self selection bias)</p> <ul style="list-style-type: none"> • to show that human resources are the most important asset (90%) • to show that the organisation is innovative (85%) • to attract new employees (80%) • to show that knowledge is the most important asset (80%) • to show that the organisation is flexible (75%) • to create an understanding for the company's products or services (70%) • to supplement the financial reports (70%). • to set up a position for themselves with respect to their competitors (65%) • to attract new and retain existing customers (65%) <p>Survey claims IC measurement supports the entity's long-term strategy. There is no known empirical support. <i>Van der Meer-Kooistra et al. (2001)</i></p> <p>IC measurement claimed to support tax advantages because the principles of valuations can be used for international tax advantage (e.g., depreciation schedules, efficient royalty structures). There is no known empirical support. <i>(Arthur 2000)</i></p> <p>Claimed to lower the cost of capital. <i>(Holland 2003, April et al. 2003).</i></p> <p>Some empirical evidence does support the idea that firms with more undisclosed intangible investment have a higher cost of capital <i>(Boone and Raman 2000).</i></p>

Table 3: Identifiable Intangible Assets Recognized by a Sample of Listed Australian Companies

Sample is diverse across firm sizes and financial and operating characteristics. The sample excludes all listed trusts and listed companies in the agriculture and financial services industries

	1993 N=224	1994 N=267	1995 N=284	1996 N=292	1997 N=296	Total N=1363	_____ Firm freq.
Patent, trademark, brand	35	39	45	41	47	207	
Trademark, brand, license	31	40	51	52	53	227	
Copyright, designs	4	3	5	4	5	21	
Licenses	22	28	35	34	33	152	
Intellectual property	7	10	14	10	13	54	
Formation costs	29	36	36	37	35	173	
Deferrals	67	77	86	85	85	400	
Royalty, franchise & rights	8	4	8	6	5	31	
Media (mastheads & publishing) rights	9	9	11	10	10	49	
Issue costs	14	18	19	15	10	76	
Mining tenements	7	7	10	7	7	38	
Technology rights	9	9	16	12	13	59	
System & software development	6	4	4	3	4	21	
Database	2	1	6	4	5	18	
Proprietary technology	5	4	6	4	7	26	

Source: Wyatt (2005)

Table 4: Usage of non-financial IC metrics by firm to support its strategic planning process, Australian organisations, 2001-2003

<i>Non-financial IC metric</i>	<i>1 Not at all</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7 Very great extent</i>	<i>Total</i>
Advanced financial performance measures: EVA (economic value added)	14.0	12.9	12.6	12.5	22.7	17.0	8.2	100
Customer satisfaction and retention measures	2.5	5.4	6.9	12.1	27.2	33.1	12.8	100
Employee satisfaction and retention measures	2.5	7.1	11.6	18.8	29.8	22.5	7.7	100
Organisational knowledge management performance measures	3.9	13.9	19.9	20.7	28.6	10.6	2.5	100
Community and other stakeholder satisfaction measures	3.8	10.4	13.4	17.1	28.0	21.9	5.5	100
An integrated financial and non-financial performance measurement system	7.9	10.7	9.9	13.2	25.2	21.6	11.5	100

Source: Melbourne Institute Business surveys, 2001-2003. University of Melbourne. Sample= 634. Sample extracted from the IBISWorld data base. For further information on these surveys see Webster (2004).

Table 5: Consultancies Providing Intangible Capital Measurement Services

<i>Company providing services</i>	<i>Region</i>	<i>Approach</i>	<i>Type of Service</i>	<i>Transparency of Process</i>
Areopa	International (France)	No clearly expressed framework. Identified following components in IC measurement: <ul style="list-style-type: none"> • Human Capital • Structural Capital • Strategic Alliances • Customer Capital. 	Patented IC Calculation (see under Activities and Solutions). “Areopa’s methods take into account a group’s Human Capital, Strategic Alliances and Customer Capital, applying proprietary perimeters and calculations.	No case studies or explanation of calculation, despite claiming that the IC Calculation is leading the field.
Celemi	International (Sweden)	Intangible assets identified in 1995 Annual Report are: <ul style="list-style-type: none"> • External Structure (customers) • Internal Structure (organisation) • Competence (people) 	<i>Learning Design</i> Consultancy, one of the first to publish information about its intangible assets (see 2002 Intangible Asset Monitor). However, Celemi focuses on knowledge management consultancy, rather than measurement of intangibles (given that the Intangible Asset Monitor is easily replicated without any consulting services).	Explanation of monitor and case studies available.
Delphi group		Delphi KM2 knowledge management audit tool.	On-line survey to be completed by employees –apparently regarding levels of satisfaction, encouragement of initiative etc., which is then benchmarked over time and against industry/national averages.	Brochure, case studies and downloadable interview, but no clear indication of type of survey questions.
Entovation International Ltd. (Debra Amidon)	International (US)	Focuses on “knowledge innovation”, but is analogous to management of intellectual capital. Assessment is “designed according to proven management architecture developed in 1989 (Amidon’s PhD thesis): Performance, Structure, People, Process , Technology”	Innovation Capital Reports (National/regional level), Entovation, Education workshops in knowledge management, Knowledge Innovation Assessment. Aims to measure “tacit knowledge” of an organisation, also offered in a cut down version for small businesses), as well as Strategy Consulting which includes intellectual capital consulting.	Website provides details of process and case study for Knowledge Innovation Assessment.
EP Frontiers	US	Not specifically on IC. Referenced literature, and explanation of how VBM works (Roadmap).	Value Based Management, specialising in EVA. Offers advisory service (Performance and Framework) and products (off shelf and customised) including Value Map (visual representation of value creation process which can be tailored to the enterprise), Value Clips (interactive learning software) and other VBM training games.	Website includes VBM roadmap outlining how a typical process works, as well as examples of value maps, and flash presentations of how they work.
Finegan & Company LLC	US	Not for intellectual capital specifically, claims to assist in value creation.	Financial advisory (strategic risk management, value-based management, transaction analysis and legal assistance), and value based education. Legal assistance includes “complex security-by-security valuations of thinly traded and illiquid investments for insurance companies” as part of litigation support.	No examples, offer general information.
GHK Consulting	China	Not for IC	Wide range of management consulting services including corporate social responsibility (which is important for managing IC), performance management. Provides wide range of other services (e.g., architecture, economic development).	List of projects, clients and description of service.
Hard Management	UK	Not for IC. Service is focused on the marketing concept.	“Training services to understand key revenue drivers – brand, and customer relations”.	Marketing statement
Hodak Value Advisors	US	Not focused on IC, but does include justification for adopting VBM. Also provides basic references.	Training programs for VBM, including value measures.	Website includes several case study illustrations.
ICcommunity	Sweden	No clearly expressed framework. “Intellectual capital refers to non-financial assets in a company or organisation - human values”	Range of knowledge management services, including Dolphin (balanced scorecard).	Description of products.
ICM Group (Sullivan)	International	Library references several frameworks, though firm	Services include Valuation (custom and ‘off-the-shelf’ NPV valuation tools	Information about services offered.

<i>Company providing services</i>	<i>Region</i>	<i>Approach</i>	<i>Type of Service</i>	<i>Transparency of Process</i>
		does not endorse any particular one. Detailed introductions provided free of charge. Components identified are: <ul style="list-style-type: none"> • Human capital • intellectual assets • Intellectual property (legally protected) 	for individual assets). Performance Reporting, Educational tools for managing IC resources, Custom Systems and Process Development	
IC-Management Group (Sullivan)		IC consists of three major components: <ul style="list-style-type: none"> • Human capital • Intellectual assets • Intellectual property 	Valuation (individual asset), strategy, value extraction and intellectual capital measurement and performance reporting.	Marketing information.
IDG Capital Group	US	EVA	Corporate finance advisory firm, which also offers VBM consulting (incorporating EVA). Provides M&A valuation services.	Little information on M&A valuation, and no information provided regarding model.
IntangAbility Ltd	UK	A “how to” guide for intangible assets.	Produced Intangibles Report for UK Government, which is a ‘how-to-guide’ for industry on identifying, measuring and profiting from intangible assets.	No evidence of application, rather, the website demonstrates establishment of framework.
Integral Performance Group (Allee)		Verna Allee has written a text setting out a scorecard.	Web-based Verna Allee Toolkit based on a scorecard approach.	Subscriber site, only allows screen captures, and little detail as to the tools.
Intellectual Capital Services (Gupta, Pike, Roos, Dragonetti)	International (Sweden)	IC-Index described in “Intellectual Capital: Navigating the New Business Landscape” (1997). Components identified are: <ul style="list-style-type: none"> • Business Recipe • Organisational Structural Capital • Human Capital • Relational Capital 	IC-Rating / Index (holistic, non-monetary scorecard method)	Several downloadable articles.
J.H.M. de Jonge Management & Advies	Europe Netherlands	Unclear	VBM training, which includes Modules on Value of Intangibles	No information
Kaieteur Institute for KM (Bryan Davis)	US	Balance scorecard (Kaplan and Norton).	Balance scorecard (Kaplan and Norton) employed as part of a knowledge pattern recognition service.	Description in a white paper of overall process.
Kepler Associates	Europe London	No framework.	Performance measurement (including balanced scorecard design), value-based management.	Description of services only.
Knowhouse	South Africa	Components identified, based on Celimi “Individual Balance Sheet” <ul style="list-style-type: none"> • External structure • Internal structure • Individual competence 	Consultancy deals exclusively in “measurement and management of Intangible Assets”. Has alliance with Celemi, and Knowhouse offers their Tango (intangible asset management simulation), Apples and Oranges (financial management) services.	Description of idea.
Knowledge Associates	International (UK)	Knowledge “portal” for compiling the firm’s knowledge in one repository – permitting access and management. Make reference to a BSI position statement on standardisation of knowledge management. The document is a stage in a programme of work begun in 2001 by the British Standards Institution to provide leadership and	Knowledge Management consultants, offering educational and consulting services.	Web site with marketing information - offer a free Global KM Benchmarking Service.

<i>Company providing services</i>	<i>Region</i>	<i>Approach</i>	<i>Type of Service</i>	<i>Transparency of Process</i>
		assistance to help the UK and other partners to develop practice in the field of Knowledge Management.		
Knowledge Research Institute (Karl and Elisabeth Wiig)	US	In-house developed material including “New Generation Knowledge Management”. Components of Intellectual Capital identified in sample IC/KM statement are: <ul style="list-style-type: none"> • Metaknowledge • Operational knowledge • Marketing knowledge • Navigational or network knowledge 	Qualitative knowledge management consulting (diagnostic, educational)	Sample IC statement, and other discussion papers.
KPMG (KPMG)	International	Unable to ascertain the approach.	Value Explorer	Marketing information.
Mercer	International US	“Play to your strengths” identifies following components of “human capital wheel”: <ul style="list-style-type: none"> • Processes • Structure • People • Rewards • Decision making • Communication, information and knowledge 	Global human capital resource consultants offering a wide array of services. Not clear whether IC metrics are available.	No information accessible.
PwC	International	Market Overview Value Strategy Value Creating Activities Financial Performance	Value Reporting	Marketing information
QPR Software	Europe Finland	MAGIC software system – selection of indices used to benchmark. Components identified: <ul style="list-style-type: none"> • Human capital • Organisational capital • Market capital (external capital) • Innovation capital 	The partners of the MAGIC project are: QPR Software (Finland), Institute for Human Factors and Technology Management IAT (Germany), Profactor (Austria), CDN (Spain), ISD (Portugal), and Invenio (Germany.) Also provide other Corporate Performance Management software, such as Balance Scorecard	On-line tryout
SDG Consulting (Luca Quagini, Andrea Tagliaferro, Matteo Rosseti among others),	Europe Italy	Balanced scorecard - Components identified: <ul style="list-style-type: none"> • Structural capital • Human capital • Relational capital 	Knowledge Management services including mapping of corporate knowledge capital, and KM performance evaluation.	Description of service only
Shareholder Value Advisors (O’Byrne, Hahn, Watsom)	US	Only brief discussion of framework behind Human Capital Accounting Analysis, though other academic material (focusing on EVA) in library.	EVA, VBM. Human Capital Accounting Analysis (capitalising expenditure on human capital, recognising future increased cash flows as income)	Medium (basic example)
Ramboll and Scandiaconsult (largest Nordic provider of knowledge services)	Europe Denmark	Model, which incorporates key competencies and benchmarking. Components are: <ul style="list-style-type: none"> • Human IC assets • Customer IC assets • Structural IC assets 	Ramboll provide a free how-to guide, and consulting services.	Sample accounts - Ramboll Group annual reports
Skyrme Associates Skyrne,	International UK	Skyrme has published “Measuring Knowledge and Intellectual Capital” (2003). Covers: <ul style="list-style-type: none"> • human capital 	“Knowledge networkers” who provide a wide range of KM services. Consulting services also provided, which would no doubt include IC measurement.	Descriptive material available in text

<i>Company providing services</i>	<i>Region</i>	<i>Approach</i>	<i>Type of Service</i>	<i>Transparency of Process</i>
		<ul style="list-style-type: none"> • structural capital • relationship capital • intellectual property 		
Stern Stewart	International NY	EVA- monetary, return on assets method	How to calculate EVA	Detailed description of EVA on website, as well as several books.
Strassmann Inc.	US	A variation of EVA (Management value-added / cost of capital) - (see article).	Consulting services - Knowledge Capital Benchmarking and Information Productivity Benchmarking. "Market Pricing of Knowledge Capital" . Also provides Knowledge Capital Assessment.	Case study (example) available Knowledge Capital data input form (which calculates and benchmarks KC)
Sveiby Knowledge Associates	International Europe Sweden	Sveiby Toolkit provides a template for the Intangible Assets Monitor - Non-monetary score card method with supporting software.	Consulting and educational programs, including Tango (simulation), KM Activity Planning, databases, valuation, invisible balance sheet.	Marketing information
TFPL	London	Intellectual capital Taxonomies, rather than IC metrics.	Knowledge and information audits -developing intangible asset registers	Free online demonstration of AutoInfoAudit, and several case studies available
UNIC (Edvinsson 1997) Intellectual capital consulting.	International Europe Sweden	Skandia navigator - Components identified: <ul style="list-style-type: none"> • Human capital (brains, skills, insights, potential) • Structural capital (customers, processes, databases, brands, systems) 	Insights - lectures on role and effect of IC, IC Assessment , Growth (IC management) and commercialisation (strategy consulting)	Basic description only
Value Management Inc.	US	No framework	Specialises in business valuation, using income/cash flow, comparable transactions and net asset or cost approach. This includes valuation of intangible assets, though no specific measures are discussed.	Basic description of valuation process
Weightless Wealth Research (Daniel Andriessen, PhD on topic associated with the Intellectual Capital Valuation)		Valuation methods for intangible resources (at least 25 different methods). "Weightless wealth: four modifications to IC theory" is key theory (see Journal of IC 2(3) p. 204).	Consulting and publishing	Material published by Andriessen, on different valuation methods.

Table 6 Specific Indicators Used by Six Major Consultants

<i>Legend</i>	
<i>cc=customer capital</i>	<i>ff=financial focus</i>
<i>hc=human capital</i>	<i>ve=value extraction</i>
<i>rc =relational capital</i>	
<i>sc=structural capital</i>	
<i>er=external relationships</i>	
<i>is=internal structure</i>	
<i>c=competence</i>	

Specific Indicators Used by Six Major Consultants						
<i>Indicator</i>	<i>ICM Group (Sullivan 2000)</i>	<i>Roos et al (1997)</i>	<i>Edvinsson & Malone (1997)</i>	<i>Allee (2000)</i>	<i>Pablos (2002, 2003)</i>	<i>Celemi (2002)</i>
Customers						
Development - Customer opportunity base captured			rd			
Development – Growth alliances				er		
Development – Growth customer base				er		
Development - Increased positive brand recognition				er		
Development – Media exposure					rc	
Development – New strategic customers					rc	
Development – Number of innovation channels				er		
Development - Number of new customers/new market/leads, stakeholders etc.	cc				rc	
Development - Percent of image enhancing projects (or clients)				er		er
Development – Organisation enhancing clients						is
Development – Competence enhancing clients						c
Development - Percent of revenue from targeted industries or countries				er		
Development - Ratio of new products to full company product family			rd			
Development – Relational marketing					rc	
Networking – Alliances with business schools					rc	
Networking - Commercial alliances					rc	
Networking – Countries of operation					rc	
Networking – Lectures at scientific conferences					rc	
Networking - Number of conferences attended					rc	
Networking – Number of operations done via phone					rc	
Profile - Annual sales (e.g., revenue) / customers	cc		cc			er
Profile - Average customer age; education; income			rd			
Profile - Average customer duration with the company (months)	ve					
Profile - Average customer size	cc		cc			
Profile - Customer demographic change				er		
Profile - Customer rating	cc		cc			
Profile - Demographics of sales				er		
Profile - Diffusion of ethics and values				er		
Profile - Distribution of sales				er		
Profile – Five largest customers during the year (e.g., as a percentage of total revenue)					rc	es
Profile - IT literacy of customers			cc			
Profile - Length of relationship		ss	cc, rd			
Profile - Market penetration				er	rc	
Profile - Market share	cc		cc		rc	
Profile - Number of customers			cc			
Profile - Percent of image enhancing customers				er		
Profile - Repeat customers				er		er
Profile – Public, Private, Semi-public clients					rc	
Profile - Ratio large to small customers				er		
Satisfaction – Customers would recommend firm					rc	
Satisfaction - Consistency of involvement				sc		
Satisfaction - Customer retention		sc				
Satisfaction - Customer satisfaction / loyalty index	cc		cc		rc	er
Satisfaction – Customers lost			cc			
Satisfaction - Partner satisfaction index		ss				
Satisfaction – Spontaneous notoriety index					rc	
Satisfaction - Turnover/loyalty				er		

Specific Indicators Used by Six Major Consultants						
<i>Indicator</i>	<i>ICM Group (Sullivan 2000)</i>	<i>Roos et al (1997)</i>	<i>Edvinsson & Malone (1997)</i>	<i>Allee (2000)</i>	<i>Pablos (2002, 2003)</i>	<i>Celemi (2002)</i>
Satisfaction – Value perception					rc	
Service - Average time from customer contract to sale response	cc		cc			
Service - Business development expense/administrative expense			rd			
Service - Contacts to contracts				er		
Service – Contracts (sales) to sales closed	cc		cc			
Service – Contracts (total)					rc	
Service - Customer time / employee attendance			ff			
Service - Customer visits to company			cc			
Service – Customers / employees			cc			
Service - Days spent visiting customers						
Service - Direct communications to customer per year			rd			
Service - Frequency of customer contact				er		
Service - Percent of customer orders filed				er		
Service - Percentage of supplied/customer business accounted for		ss				
Service - Points of sales				er	rc	
Service – Relationship investment / customer	ve		rd			
Service - Revenue generating staff			cc			
Service - Sales per customer				er		
Service - Speed of employee customer / supplier orientation				is		
Service - Support expense / customer / year or contract			cc			
Stakeholders – Contacts with investors and analysts					rc	
Stakeholders – Favourable recommendations from analysts					rc	
Stakeholders – Solved consultations with shareholders					rc	
Information Technology						
Access - Computers per employee, computers per office	sc		sc	is	sc	
Access - Employees connected via email					sc	
Access - Employees with option of tele working					sc	
Access - IT Capacity per employee			sc			
Access - IT Literacy of staff		hc	hf			
Access - Servers per worker					sc	
Efficiency - Change in IT inventory			sc			
Efficiency - Discontinued IT inventory / IT inventory			sc			
Efficiency - Orphan IT inventory / IT inventory			sc			
Investment - IT capacity (CPU and DASD)			sc			
Investment - IT development expense / IT expense			rd			
Investment - IT expense per administrative expense			sc			
Investment - IT expense per employee			sc		sc	
Investment - IT expenses on training / IT expense			rd			
Investment - IT investment per salesperson			cc			
Investment - IT investment / service and support employee			cc			
Investments - In: IT; computer equipment	sc		ff		sc	
Outcome - Hits on website (per day, homepage per month)			cc		sc	
Outcome – IT performance per employee			sc			
Outcome - Value added per IT employees			ff			
Process related						
Best practices on intranet (number)					sc	
Cycle / process times		sc		is		
Databases to which the firm has access (number)					sc	
Enquiries handled within same day (per cent)					sc	
Investment in premises and office equipment					sc	
Office space (m2)					sc	
Percent of structure enhancing projects				is		
Percentage compatible systems				is		
Processes / contracts completed without error	sc	sc	sc			
Processing time; out payments	sc		sc			
Response time for calls to switch					sc	
Shared documents on intranet (number)					sc	
Shared knowledge databases					sc	
Speed of change				is		
Speed of decision making				er		
Speed of employee customer / supplier orientation				is		
Updated knowledge documents on intranet (number)					sc	
Utilisation rate of: administration support, hardware, software				is		

Specific Indicators Used by Six Major Consultants						
<i>Indicator</i>	<i>ICM Group (Sullivan 2000)</i>	<i>Roos et al (1997)</i>	<i>Edvinsson & Malone (1997)</i>	<i>Allee (2000)</i>	<i>Pablos (2002, 2003)</i>	<i>Celemi (2002)</i>
licences, databases, physical assets						
Employees (excluding IT)						
Hiring – Unsolicited application					rc	
Hiring - Ratio local hires (see also under Community)				sc		
Hiring – Quality number of job applicants				er , sc		
Hiring - Ratio job offers to acceptance				sc		
Hiring - Ratio local hires				sc		
Hiring - Successful hires				er		
Involvement - Brand recognition				er		
Involvement - Employee involvement (e.g., in internal improvement and technological innovation projects)				er	sc	
Involvement - Level of employee awareness				er		
Involvement - Levels of conformance to values				er		
Involvement - New solutions / products/processes suggested		hc				
Involvement - Savings / implemented employee suggestion		hc				
Involvement - Share ownership, programs			hf			
Involvement – Suggestion systems (money and point prizes)					hc	
Other - Administrative expenses per employees			sc			
Other – Hourly paid workers					hc	
Other – Officials					hc	
Profile – Administration staff (e.g., non-revenue generating) / total staff				hc		is
Profile – Age distribution				hc	hc	
Profile – Age of employees (average)	hc		hf		hc	c
Profile – Age of full-time employees (average)	hc		hf			
Profile – Age; share of employees under age 40			rd			
Profile - Background varied index (individual, group)		hc				
Profile - Company diversification index		hc		hc		
Profile – Distribution of staff by departments					hc	
Profile – Education (unskilled, skilled, office, trade, IT, bachelors, academics, PhD awards)					hc	
Profile – Experience (Average years, professional experience)				hc		c
Profile – Experience (average years service with company)	hc	hc	hf			is
Profile – Experience				hc		is
Profile – Experience; International					hc	
Profile – Female / Male employees					hc	
Profile – Female directors / total directors			hf			
Profile – Female managers	hc		hf			
Profile - Number of employees	hc					
Profile - Number of full-time employees	hc		hc		hc	
Profile - Number of managers	hc		hc		hc	
Profile – Percent with higher education				hc		c
Profile - Percentage of company managers with advanced degrees (pertinent experience in trade and IT)	hc	hc	hc			
Profile – Ratio promoted staff / total staff					hc	
Profile - Temporary employees			hc	hc		
Result – Absence due to sickness					hc	
Result – Growth in professional competence						c
Result - Contracts per employee				is		
Result – personal injury with loss of working hours, minor					hc	
Result – Profits / employee	hc					
Result – Revenues / employee	hc					
Results – Revenue / Administration staff						is
Result - Value added per expert employee				hc		c
Satisfaction – Percentage staff feeling explicit recognition					hc	
Satisfaction – Percentage staff feeling opinion considered					hc	
Satisfaction - Empowerment index			hc			
Satisfaction – Leadership index		hc	hc			
Satisfaction - Motivation index		hc	hc			
Satisfaction - Satisfied employee index (employee satisfaction, percentage staff happy about working environment)	ve		rd	hc	hc	c
Satisfaction – Staff with opportunity for on-skills development					hc	
Satisfaction – Turnover	hc		hc			
Satisfaction – Turnover; Administration Staff				is		is
Satisfaction – Turnover; Valued / expert employees				hc, er		c
Satisfaction –Turnover (beginners, resigned, circulation)					hc	

Specific Indicators Used by Six Major Consultants						
<i>Indicator</i>	<i>ICM Group (Sullivan 2000)</i>	<i>Roos et al (1997)</i>	<i>Edvinsson & Malone (1997)</i>	<i>Allee (2000)</i>	<i>Pablos (2002, 2003)</i>	<i>Celemi (2002)</i>
Training - Communication and support programs for full-time employees				hc		
Training – Competence development			rd			
Training – Competency utilisation (profiling)				hc		
Training – Consistency of behaviours				er		
Training – Consistency of value alignment over time				er		
Training - Diffusion of best practices				hc		
Training – Expense / employee, hours/employee		sc				
Training - Frequency of revisiting values by leadership				er		
Training – Hours (training) / non-training hours (annual)					hc	
Training - Hours spent by senior staff explaining strategy and actions (overlap expertise)		hc				
Training - Hours spent in debriefing		hc				
Training – Hours / Days training per employee (or total)				hc	hc	
Training - Knowledge reuse				hc		
Training - Leadership training				er		
Training – Number of competence, carrier development plans					hc	
Training - Per capita annual cost of training			hc			
Training - Percent of budget learning together				hc		
Training – Share of training hours			rd			
Training - Succession ratio, planning				hc		
Training - Succession planning				er		
Training – Training expense / administrative expense	ve					
Training - Training expense / employee (or total wage)	ve				Hc	
Training – Values alignment				er		
Macro Financial Measures						
Administrative expense / gross premium			sc			
Administrative expenses / total revenues	sc	sc				
Corporate performance / quality goal			sc			
Corporate quality performance	sc		sc			
Educational investment / customer			rd			
Expense / employee			rd			
Growth - Percent of “growth” projects				hc		
Growth – Profits resulting from new business operations	ve					
Growth - Renewal expenses / operating expenses		sc				
Growth – Return on net assets resulting from new business operations	ve		ff			
Growth - Revenues resulting from new business operations	ve		ff			
Lost business revenues compared to market average			ff			
Opportunity share			rd			
Profits / employee			ff			
Profits / total assets			ff			
Return on net asset value	ve		ff			
Revenue / administration support				is		
Revenues / employee			ff			
Revenues / total assets			ff			
Total assets	ve		ff			
Total assets / employee	ve					
Total market value of firm	ve		ff			
Value added margin on sales					c	
Value added / employee or IT employees or customers			ff			
Research & Development						
Other – Share of development hours			rd			
Investment - Codification of knowledge/processes				is		
Investment - Contributions to knowledge base				is		
Investment – In new product support and training	ve		rd			
Investment - Non-product related expense / customer / year			rd			
Investment - Employees with formation on total quality					Sc	
Investment - Number of improvement groups					Sc	
Investment - Number of quality committees					Sc	
Investment – Intangible investments / value added.						is
Investment – R&D expense/administrative expense			rd			
Investment – R&D invested in basic research, products, services, applications,	ve		rd	is	Sc	
Investment - R&D resource/total resources (e.g., Celemi uses R&D / revenues)			rd			is

Specific Indicators Used by Six Major Consultants						
<i>Indicator</i>	<i>ICM Group (Sullivan 2000)</i>	<i>Roos et al (1997)</i>	<i>Edvinsson & Malone (1997)</i>	<i>Allee (2000)</i>	<i>Pablos (2002, 2003)</i>	<i>Celemi (2002)</i>
Investment - Structural capital development			rd			
Investments – In developing new markets			rd			
Outcome - Accreditations and certificates					Sc	
Outcome - Average age of company patents			rd			
Outcome - Growth intellectual property				is		
Outcome - Number of ISO 9000 certificates					Sc	
Outcome - Number of new products/services					Sc	
Outcome - Number of products / services					Sc	
Outcome - Patents pending or filed, software, databases developed	ve	sc	rd			
Outcome - Percentage of (corporate) group turnover					Sc	
Outcome - ROI from improvement ideas				hc		
Outcome - Total innovation					Sc	
Outcome - Revenues from patents /software / data /databases		sc				
Outcome - Percentage of business (e.g., revenues) from new products		sc				is
Outcome - Value of EDI system, upgrades, capacity			rd			
Community Health						
Community - Percent of community involvement					sc	
Community - Ratio local hires (see also employees)					sc	
Community - Desirability as place to work or live					er	
Community - Local quality of life where operating					er	
Environmental Health						
Environment - Conformance to values and standards					er	
Environment - Growth of renewable needed resources					er	
Environment - Increase “green” brand recognition					er	
Environment - Increase resources availability					er	
Environment - Number of breadth or depth environmental practices					er	
Environment - Percent of waste products					er	
Environment - Percent of zero waste projects					er	
Environment - Percent renewal of used resources					er	
Environment - Quality of environment local and global					er	
Environment - Regulatory compliance					er	
Environment – Resource efficiencies					er	