

# Methods for Measuring Intangible Assets

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The research into measuring the Intangible Assets or the Intellectual Capital of companies has produced a plethora of proposed methods and theories over the last few years. In this latest update of the Paper I provide a brief overview of 42 methods that I have come across with links to more information. The list is an ever-expanding community effort, so if you are aware of a method that I have missed, please notify me!

## Measure for Value Creation - not for Control or PR!

Rarely is the question asked, why measure intangibles? The answer is not self-evident. Intangibles are difficult and expensive to measure and the results are uncertain, so the reason had better be a good one.

### The Fundamental dilemma

The main problem with measurement systems is that **it is not possible to measure social phenomena with anything close to scientific accuracy**. All measurement systems, including traditional accounting, have to rely on proxies, such as dollars, euros, and indicators that are far removed from the actual event or action that caused the phenomenon. This creates a basic inconsistency between managers' expectations, the promises made by the method developers and what the systems can actually achieve and makes all these systems very fragile and open to manipulation. Therefore, the first question for any one embarking on a measurement initiative must be: **What is the purpose of our measuring initiative?**

### Management Control purpose ó Don't!

The most common reason for measuring and reporting is to improve internal performance, i.e. **management control**. It is so common that the purpose is generally not even stated explicitly. The idea is founded on one of the most quoted management slogans; ~~you~~ you can only manage what you measure+. It is a simple slogan and unfortunately completely erroneous.

The trouble is that people don't like being measured upon. I don't. Do you? Or are the measuring systems only for measuring the others? We find all kinds of ways to evade and obstruct the systems. Then add an individual reward system tied to the measurement system and we have an explosive concoction. The temptations to manipulate the system become overwhelming! And, who controls the controller? Consider Shell Oil's management control failure:

Oil and gas reserves are very important of an oil company like Shell. The trouble is that Shell in the late 1990's made oil reserves a target with a reward tied to it for the managers if they succeeded in increasing them. Guess what, the Shell oil reserves displayed a healthy development since 1998. Everything seemed to go well, until the end of 2003. In January 2004 a deeply embarrassed Shell board had to confess that they had overstated the reserves by 4,4 billion oil equivalents, or 23% of the total reserves and the abuse had been going on for at least five years. The managers were fired of course, but the problem is in the system.

Oil and gas reserves cannot be measured exactly since estimation of reserves involves subjective judgment. If this can happen with physical resources, what do you suspect can happen with valuing intangible assets? Is your company immune? If this could happen in Shell, what do you imagine

might going on in your own company? Even the traditional accounting system suffers from regular manipulation despite being heavily regulated by governing bodies and audit and with heavy penalties imposed on offenders. Imagine the abuse an intangibles measurement system is open to; there is no standard, no audit and it is voluntary only.

## **PR purpose ó Watch out!**

Why are the oil and gas companies pioneers in reporting their environmental impact? Why is there a surge in triple-bottom line reporting? The majority of the companies that have been the pioneers in **reporting** intangibles externally, have done so for one major reason; **PR**. The PR reason seems to hold true for most of the stakeholder reporting, triple-bottom line reporting and also the IC scorecards pioneered by companies such as Skandia and Celemi.

We need not suspect more sinister 'Enron' motives, just because the purpose is PR, but we, as readers, must be prepared to ask the **why**, when we judge the validity of the numbers reported.

It seems that Skandia's share price, for a while at least, benefited from the company being one of the pioneers in IC reporting according to presentations made by Skandia managers during the boom years in 1999 - 2000. However, those, who bought Skandia shares based on their IC supplements back then were looking at losses amounting to 90% in 2002! So unless shareholders are prepared to ask the **why**, the costs for intangibles reporting may come out of their own pockets in the end.

## **Learning Motive ó Why so few?**

So entrenched are the traditional measuring paradigms that executives and researchers have not even started to explore the most interesting reason for measuring intangibles; the **learning motive**. Measuring can be used to **uncover costs** or to **explore value creation opportunities** otherwise hidden in the traditional accounts. What is the trend of cost of staff turnover? What is the value of the learning that takes place when staff interact with customers? What is the value creation opportunity lost in having inadequate processes?

The learning motive promises the highest long-term benefits. First; the learning motive offers the best way around the manipulation issue. If the purpose is learning, not control or reward, the employees and managers can relax. Second, a learning purpose allows more creativity in the design of metrics, a more process-oriented bottom-up approach and less of top-down commands. Read more about why measuring for learning is a better alternative than measuring for control.

But where does the fine line go? When is a system control and when is it learning? When does learning become control? Admittedly, this is not easy, but here are a few pointers. First; the process of developing the metrics is different. The metrics are produced bottom-up, with heavy involvement from all relevant groups. No trumpets from the accountants' ivory tower! Secondly, the indicators are used by the same people who produce them and they use them to improve their own processes, not somebody else's. Third, the indicators are reported openly to everyone. Fourth; when the indicators suggest a difference between say, a high-performing and a low-performing unit, the units in question are required to meet and the difference becomes the starting point of a dialogue to discover hidden value; are we measuring the same thing? What is it that we can do better? Fifth; the indicators are never the basis of a reward system. If rewards are to be distributed at all they should be group-based and allocated to those, who make the highest value improvement, i.e. possibly the previous low-performing unit!

# The Four Approaches for Measuring Intangibles

The suggested measuring approaches for intangibles fall into at least four categories of measurement approaches. The categories are an extension of the classifications suggested by Luthy (1998) and Williams (2000).

- ✚ **Direct Intellectual Capital methods (DIC).** Estimate the \$-value of intangible assets by identifying its various components. Once these components are identified, they can be directly evaluated, either individually or as an aggregated coefficient.
- ✚ **Market Capitalization Methods (MCM).** Calculate the difference between a company's market capitalization and its stockholders' equity as the value of its intellectual capital or intangible assets.
- ✚ **Return on Assets methods (ROA).** Average pre-tax earnings of a company for a period of time are divided by the average tangible assets of the company. The result is a company ROA that is then compared with its industry average. The difference is multiplied by the company's average tangible assets to calculate an average annual earning from the Intangibles. Dividing the above-average earnings by the company's average cost of capital or an interest rate, one can derive an estimate of the value of its intangible assets or intellectual capital.
- ✚ **Scorecard Methods (SC).** The various components of intangible assets or intellectual capital are identified, and indicators and indices are generated and reported in scorecards or as graphs. SC methods are similar to DIC methods, except that no estimate is made of the \$-value of the Intangible assets. A composite index may or may not be produced.

The methods offer different advantages. The methods offering \$-valuations, such as ROA and MCM methods are useful in merger & acquisition situations and for stock market valuations. They can also be used for comparisons between companies within the same industry and they are good for illustrating the financial value of Intangible assets, a feature, which tends to get the attention of the CEOs. Finally, because they build on long established accounting rules they are easily communicated in the accounting profession. Their disadvantages are that by translating everything into money terms they can be superficial. The ROA methods are very sensitive to interest rate and discounting rate assumptions and the methods that measure only on the organisation level are of limited use for management purposes below board level. Several of them are of no use for non-profit organisations, internal departments and public sector organisations; this is particularly true of the MCM methods.

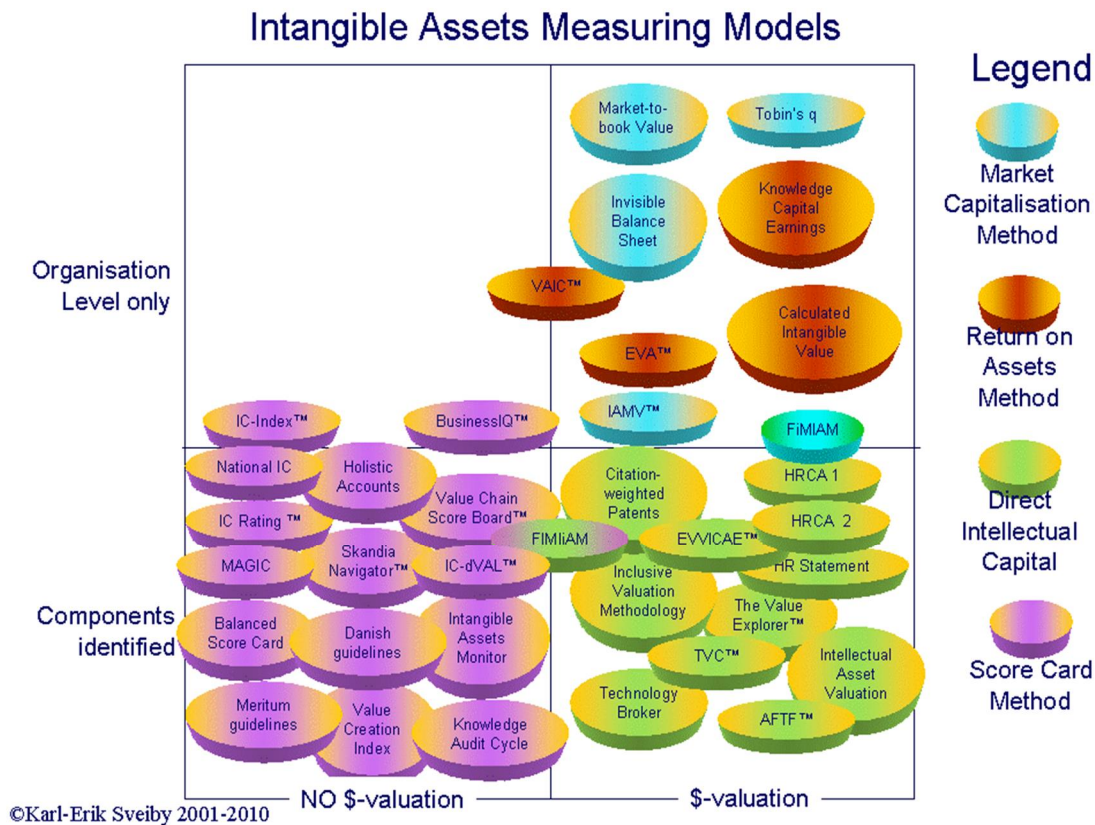
The advantages of the DIS and SC methods are that they can create a more comprehensive picture of an organisation's health than financial metrics and that they can be easily applied at any level of an organisation. They measure closer to an event and reporting can therefore be faster and more accurate than pure financial measures. Since they do not need to measure in financial terms they are very useful for non-profit organisations, internal departments and public sector organisations and for environmental and social purposes. Their disadvantages are that the indicators are contextual and have to be customised for each organisation and each purpose, which makes comparisons very difficult. The methods are also new and not easily accepted by societies and managers who are used to see everything from a pure financial perspective. The comprehensive approaches can generate oceans of data, which are hard to analyse and to communicate.

## The purpose determines the approach

The intangibles measuring approaches best suited for the measuring motives are:

1. Monitor Performance (Control). Best are Baldrige award-type of performance indicators and KPIs.
2. Acquire/Sell Business (Valuation). Best are Industry rules-of-thumb (\$ per click, \$ per client, brand valuation).
3. Report to Stakeholders (Justification, PR). Best are IC supplements, EVA, Triple-bottom line.
4. Guide Investment (Decision). None of the intangibles approaches can beat traditional Discounted Cash Flow.
5. Uncover Hidden Value (Learning). Best are score cards and Direct IC methods.

No one method can fulfil all purposes; One must select method depending on purpose, situation and audience.



## 42 Methods for Measuring Intangibles in Chronological Order

Approx. year	Label	Major Proponent	Category	Description of Measure
2009	ICU Report	<i>Sanchez 2009</i>	SC	ICU is a result of an EU-funded project to design an IC report specifically for universities. Contains three parts: (1) Vision of the institution, (2) Summary of intangible resources and activities, (3) System of indicators.
2008	EVVICAIE	<i>McMcCutcheon (2008)</i>	DIC	Developed by the Intellectual Assets Centre in Scotland as a web-based EVVICAIE toolkit based on the work of Patrick H. Sullivan (1995/2000).
2008	Regional Intellectual Capital Index (RICI)	<i>Schiuma, Lerro, Carlucci (2008)</i>	SC	Uses the concept of the Knoware Tree with four perspectives: (hardware, netware, wetware, software) to create a set of indicators for regions.
2007	Dynamic monetary model	<i>Milost (2007)</i>	DIC	The evaluation of employees is done with analogy from the evaluation of tangible fixed assets. The value of an employee is the sum of the employee's purchase value and the value of investments in an employee, less the value adjustment of an employee.
2004	IAbM	<i>Japanese Ministry of Economy, Trade and Industry.</i>	SC	Intellectual asset-based management (IAbM) is a guideline for IC reporting introduced by the Japanese Ministry of Economy, Trade and Industry. An IAbM report should contain: (1) Management philosophy. (2) Past to present report. (3) Present to future. (4) Intellectual-asset indicators. The design of indicators largely follows the MERITUM guidelines. Described in Johansson & al. (2009)
2004	SICAP		SC	An EU funded project to develop a general IC model specially designed for public administrations and a technological platform to facilitate efficient management of the public services. The model structure identifies three main components of intellectual capital: public human capital, public structural capital and public relational capital. Described in Ramirez Y. (2010)
2004	National Intellectual Capital Index	<i>Bontis (2004)</i>	SC	A modified version of the Skandia Navigator for nations: National Wealth is comprised by Financial Wealth and Intellectual Capital (Human Capital + Structural Capital)
2004	Topp-linjen/ Business IQ	<i>Sandvik (2004)</i>	SC	A combination of four indices; Identity Index, Human Capital Index, Knowledge Capital Index, Reputation Index. Developed in Norway by consulting firm Humankapital-gruppen.
2003	Public sector IC	<i>Bossi (2003)</i>	SC	An IC model for public sector, which builds on Garcia (2001) and adds two perspectives to the traditional three of particular importance for public administration: transparency and quality. It also identifies negative elements, which generate intellectual liability. The concept of intellectual liability represents the space between ideal management and real management, one of the duties a public entity must fulfil for society. Described in Ramirez Y. (2010)
2003	Danish guidelines	<i>Mouritzen, Bukh &amp; al. (2003)</i>	SC	A recommendation by government-sponsored research project for how Danish firms should report their intangibles publicly. Intellectual capital statements consist of 1) a knowledge narrative, 2) a set of management challenges, 3) a number of initiatives and 4) relevant indicators.

2003	IC- dVALÎ	<i>Bonfour (2003)</i>	SC	ðDynamic Valuation of Intellectual Capitalö. Indicators from four dimensions of competitiveness are computed: Resources & Competencies, Processes, Outputs and Intangible Assets (Structural Capital and Human Capital indices). Journal of IC vol 4 Iss 3 2003
2002	Intellectus model	<i>Sanchez- Canizares (2007)</i>	SC	Intellectus Knowledge Forum of Central Investigation on the Society of Knowledge. The model is structured into 7 components, each with elements and variables. Structural capital is divided in organizational capital and technological capital. Relational capital is divided in business capital and social capital.
2002	FiMIAM	<i>Rodov &amp; Leliaert (2002)</i>	DIC/M CM	Assesses monetary values of IC components. a combination both tangible and Intangible assets measurement. The method seeks to link the IC value to market valuation over and above book value. Journal of IC vol 3 Iss 3 2002
2002	IC RatingÎ	<i>Edvinss on (2002)</i>	SC	An extension of the Skandia Navigator framework incorporating ideas from the Intangible Assets Monitor; rating <i>efficiency, renewal</i> and <i>risk</i> . Applied in consulting.
2002	Value Chain Scoreboar dÎ	<i>Lev B. (2002)</i>	SC	A matrix of non-financial indicators arranged in three categories according to the cycle of development: Discovery/Learning, Implementation, Commercialization. Described in book Lev (2005): <i>Intangibles: Management, Measurement and Reporting</i> .
2002	Meritum guidelines	<i>Meritum Guidelin es (2002)</i>	SC	An EU-sponsored research project, which yielded a framework for management and disclosure of Intangible Assets in 3 steps: 1) define strategic objectives, 2) identify the intangible resources, 3) actions to develop intangible resources. Three classes of intangibles: Human Capital, Structural Capital and Relationship Capital. The original Meritum final report can be found here. Meritum is also further developed by members of E*KNOW-NET. A summary is found on P.N Bukh's home page.
2001		<i>Caba &amp; Sierra (2001)</i>	SC	An IC measuring model for public sector based on the European Foundation Quality Management Model (EFQM). It integrates the elements from the EFQM model in three blocks which compose intellectual capital: human capital, structural capital and relational capital. Described in Ramirez Y. (2010)
2001	Intangible assets statement	<i>Garcia (2001)</i>	SC	An IC measuring model for public sector based on the IAM with Indicators of: growth/renovation efficiency and stability.
2001	Know- ledge Audit Cycle	<i>Schiuma &amp; Marr (2001)</i>	SC	A method for assessing six knowledge dimensions of an organisation's capabilities in four steps. 1) Define key knowledge assets. 2) Identify key knowledge processes. 3) Plan actions on knowledge processes. 4) Implement and monitor improvement, then return to 1). Described in book (2002). <i>Profit with People</i> by Deloitte & Touche. Hard to find. Try Giovanni Schiuma's homepage.
2000	Value Creation Index (VCI)	<i>Baum, Ittner, Larcker, Low, Siesfeld, and Malone (2000)</i>	SC	Developed by Wharton Business School, together with Cap Gemini Ernst & Young Center for Business Innovation and Forbes. They estimate the importance of different nonfinancial metrics in explaining the market value of companies. Different factors for different industries. The VCI developers claim to focus on the factors that markets consider important rather than on what managers say is important.
2000	The Value Explorer Î	<i>Andriess en &amp; Tiessen (2000)</i>	DIC	Accounting methodology proposed by KMPG for calculating and allocating value to 5 types of intangibles: (1) Assets and endowments, (2) Skills & tacit knowledge, (3) Collective values and norms, (4) Technology and explicit knowledge, (5) Primary and management processes. Described in Journal of IC 2000.

2000	Intellectual Asset Valuation	<i>Sullivan (2000)</i>	DIC	Methodology for assessing the value of Intellectual Property.
2000	Total Value Creation, TVCÎ	<i>Anderson &amp; McLean (2000)</i>	DIC	A project initiated by the Canadian Institute of Chartered Accountants. TVC uses discounted projected cash-flows to re-examine how events affect planned activities.
1999	Knowledge Capital Earnings	<i>Lev (1999)</i>	ROA	Knowledge Capital Earnings are calculated as the portion of normalised earnings (3 years industry average and consensus analyst future estimates) over and above earnings attributable to book assets. Earnings are then used to capitalise Knowledge Capital. Found on Baruch Lev's home page
1998	Inclusive Valuation Methodology IVM)	<i>McPherson (1998)</i>	DIC	Uses hierarchies of weighted indicators that are combined, and focuses on relative rather than absolute values. Combined Value Added = Monetary Value Added combined with Intangible Value Added.
1998	Accounting for the Future (AFTF)	<i>Nash H. (1998)</i>	DIC	A system of projected discounted cash-flows. The difference between AFTF value at the end and the beginning of the period is the value added during the period.
1998	Investor assigned market value IAMVÎ	<i>Standfield (1998)</i>	MCM	Takes the Company's True Value to be its stock market value and divides it in Tangible Capital + (Realised IC + IC Erosion + SCA (Sustainable Competitive Advantage).
1997	Calculated Intangible Value	<i>Stewart (1997)</i>	MCM	The value of intellectual capital is considered to be the difference between the firm's stock market value and the company's book value. The method is based on the assumption that a company's premium earnings, i.e. the earnings greater than those of an average company within the industry, result from the company's IC. It is hence a forerunner of Lev's Knowledge Capital model. Kujansivu & Lönnqvist (2007) gives a good example of the calculation.
1997	Economic Value Added (EVAÎ )	<i>Stern &amp; Stewart 1997</i>	ROA	Calculated by adjusting the firm's disclosed profit with charges related to intangibles. Changes in EVA provide an indication of whether the firm's intellectual capital is productive or not. EVA is the property of and supported by the consulting firm Sternstewart and it has become one of the most commonly used methods.
1997	Value Added Intellectual Coefficient (VAICÎ )	<i>Pulic (1997)</i>	ROA (doesn't fit any of the categories)	An equation that measures how much and how efficiently intellectual capital and capital employed create value based on the relationship to three major components: (1) capital employed; (2) human capital; and (3) structural capital. $VAICÎ_i = CEE_i + HCE_i + SCE_i$
1997	IC-IndexÎ	<i>Roos, Roos, Dragonetti &amp; Edvinsson (1997)</i>	SC	Consolidates all individual indicators representing intellectual properties and components into a single index. Changes in the index are then related to changes in the firm's market valuation.
1996	Technology Broker	<i>Brooking (1996)</i>	DIC	Value of intellectual capital of a firm is assessed based on diagnostic analysis of a firm's response to twenty questions covering four major components of intellectual capital: Human-centred Assets, Intellectual Property Assets, Market Assets, Infrastructure Assets.

1996	Citation-Weighted Patents	<i>Dow Chemical (1996)</i>	DIC	A technology factor is calculated based on the patents developed by a firm. Intellectual capital and its performance is measured based on the impact of research development efforts on a series of indices, such as number of patents and cost of patents to sales turnover, that describe the firm's patents. The approach was developed by Dow Chemical and is described by Bontis (2001).
1995	Holistic Accounts	<i>Rambøll Group</i>	SC	Rambøll is a Danish consulting group, which since 1995 reports according to its own "Holistic Accounting" report. It is based on the EFQM Business Excellence model. Describes nine key areas with indicators: Values and management, Strategic processes, Human Resources, Structural Resources, Consultancy, Customer Results, Employee Results, Society Results and Financial Results. Their report is still (2016) published and it can be downloaded from <a href="http://www.ramboll.com">www.ramboll.com</a> .
1994	Skandia Navigator I	<i>Edvinsson and Malone (1997)</i>	SC	Intellectual capital is measured through the analysis of up to 164 metric measures (91 intellectually based and 73 traditional metrics) that cover five components: (1) financial; (2) customer; (3) process; (4) renewal and development; and (5) human. Skandia insurance company brought it to fame, but Skandia no longer produces the report.
1994	Intangible Asset Monitor	<i>Sveiby (1997)</i>	SC	Management selects indicators, based on the strategic objectives of the firm, to measure four aspects of creating value from 3 classes of intangible assets labelled: People's competence, Internal Structure, External Structure. Value Creation modes are: (1) growth (2) renewal; (3) utilisation/efficiency; and (4) risk reduction/stability. See further this website
1992	Balanced Score Card	<i>Kaplan and Norton (1992)</i>	SC	A company's performance is measured by indicators covering four major focus perspectives: (1) financial perspective; (2) customer perspective; (3) internal process perspective; and (4) learning perspective. The indicators are based on the strategic objectives of the firm. The BSC has become the most used application for control.
1990	HR statement	<i>Ahonen (1998)</i>	DIC	A management application of HRCA widespread in Finland. The <i>HR profit and loss account</i> divides personnel related costs into three classes for the human resource costs: renewal costs, development costs, and exhaustion costs. 150 listed Finnish companies prepared an HR statement in 1999.
1989	The Invisible Balance Sheet	<i>Sveiby (ed. 1989) Konrad-group</i>	MCM	The difference between the stock market value of a firm and its net book value is explained by three interrelated "families" of capital; Human Capital, Organisational Capital and Customer Capital. The three categories first published in this book in Swedish have become a de facto standard. See further this website.
1988	Human Resource Costing & Accounting (HRCA 2)	<i>Johansson (1996)</i>	DIC	Calculates the hidden impact of HR related costs which reduce a firm's profits. Adjustments are made to the P&L. Intellectual capital is measured by calculation of the contribution of human assets held by the company divided by capitalised salary expenditures. Has become a research field in its own right.
1970s	Human Resource Costing & Accounting (HRCA 1)	<i>Flamholtz (1985)</i>	DIC	The pioneer in HR accounting, Eric Flamholtz, has developed a number of methods for calculating the value of human resources. Several papers are available for download on his home page.
1950s	Tobin's q	<i>Tobin James</i>	MCM	The "q" is the ratio of the stock market value of the firm divided by the replacement cost of its assets. Changes in "q" provide a proxy for measuring effective performance or not of a firm's intellectual capital. Developed by the Nobel Laureate economist James Tobin in the 1950s.



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