

**EUROPEAN COMMISSION
DG RESEARCH**

**REPORT TO THE COMMISSION
OF THE HIGH LEVEL EXPERT GROUP ON
RICARDIS**

***REPORTING INTELLECTUAL CAPITAL
TO AUGMENT RESEARCH, DEVELOPMENT &
INNOVATION
IN SMES***



END-REPORT

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Preface by the European Commission

Executive Summary

Introduction

In December of 2004 the Directorate General for Research and Technological Development (DG RTD) of the European Commission (EC) set up a High-Level Expert Group to propose a series of measures to stimulate the reporting of Intellectual Capital in research-intensive Small and Medium-Sized Enterprises (SMEs). The Expert Group has focused on enterprises that either perform Research and Development (R&D), or use the results of R&D to innovate and has also considered the implications for the specialist R&D units of larger enterprises, dedicated Research & Technology Organizations, and Universities. In this report the Expert Group presents its findings leading to six recommendations to stimulate the reporting of Intellectual Capital SMEs by raising awareness, improving reporting competencies, promoting the use of Intellectual Capital Reporting and facilitating standardization.

Intellectual Capital is the hidden driver

The traditional accounting model is based on the principle of historic cost and for this reason only a very narrow range of intangibles is included within financial statements. In providing a record of what has happened in the past, historic cost accounts provide a useful starting point in assessing the performance of a business but without forward looking information the picture that they provide is incomplete.

Intellectual Capital (IC) statements take a different and complementary stance by considering those things which are valuable in considering the future (rather than the past) and this means that a much wider range of intangibles need to be included. Taking historic financial statements and forward-looking IC statements together is aimed at improving the transparency of the way in which an organisation is seeking to create value.

At the centre of this assessment is the quality of decisions being made by management, which relate to the future prospects of the business. First and foremost IC statements are primarily about internal reporting, management and control of the business but this internal focus is an essential pre requisite for the ability of management to communicate what they are doing to external audiences which is of particular importance when the organisation needs to seek finance from banks or equity from investors.

A good IC report will improve an organisations internal processes for managing its overall resources, both tangible and intangible and more importantly it will provide a sound basis for improving the quality of the dialogue with financiers by explaining why the organisation does what it does and how it is building the resources and capabilities necessary to succeed in the future. IC statements help to clarify the way in which competitive advantage is being built by providing a narrative which explains both value chain positioning and the business model which is to be used to create value.

For research-intensive SMEs, with their focus on R&D, innovation and future prospects, the ability to provide a credible picture of what is being done and why this will result in future success is particularly important. In the Communications on Investing in Research: an action plan for Europe COM[2003]226 and the Communications on business-related services COM[2003]747 the European Commission intends to address this issue of improved identification, measuring and

reporting in order to overcome the present lack of reliable information about the intellectual capital of a company. This is especially relevant for research-intensive SMEs that often are IC intensive but have less means compared to larger enterprises to convince investors about the value of their IC.

IC has been defined as the combination of an organization's Human, Organizational and Relational resources and activities. It includes the knowledge, skills, experiences and abilities of the employees, its R&D activities, organizational routines, procedures, systems, databases and its Intellectual Property rights, as well as all of the resources linked to its external relationships; such as with its customers, suppliers, R&D partners, etc (MERITUM, 2002). IC can be both the product of R&D activities and the enabler for creating greater value from R&D. This combination of intangible resources and activities allows an organisation to transform a bundle of material, financial and human resources in a system capable of creating stakeholder value. Intangibles to become part of the intellectual capital of an organisation have to be durably and effectively internalised and/or appropriated by this organisation.

IC is the result of, and the prerequisite for, successful R&D

IC is a key element in an organisation's future earning potential. Theoretical and empirical studies show that it is the unique combination of the different elements of IC and tangible investments that determines the competitive advantage of an enterprise. R&D and innovation can be regarded as one element of IC. However, research-intensive enterprises not only invest in R&D and innovation but also in other forms of IC. Empirical studies deliver evidence for the tight link and contingency between investments in R&D, innovation, human resources and relational capital.

Investments in R&D alone are not sufficient. To succeed, a research-intensive SME needs to master critical complementary assets, either in ownership or as part of a wider value constellation. Reporting on R&D and innovation resources by the SME is not sufficient but needs to be supplemented with reporting on crucial complementary assets, developing the ability to sense and seize new opportunities as well as learning to protect its IC.

Barriers for investing in R&D

Investments in R&D and innovation are intangible investments per se and considerably risky and uncertain, in comparison with other investments. The problem of protecting the IC, the frequent long-term character of the investment and the lack of understanding of the nature of research and innovation make it hard for investors to assess the investments involved. Hence, the perceived risk is appraised as being high, often higher than necessary. Moreover, in general research-intensive SMEs have a disadvantage in comparison to larger enterprises with respect to interest rates and bank charges. Research-intensive SMEs are also mostly not able to share their risk in the way that larger companies can by carrying out a portfolio of projects because many research-intensive SMEs often only invest in one single innovation or research project at a time.

The main barriers for investing in R&D and innovation by research-intensive SMEs can be grouped into four areas: i) lack of financial resources, ii) lack of knowledge, iii) lack of human capital and iv) lack of management competences. Empirical evidence shows that all four barriers can be addressed by IC Reporting.

The Contribution of Intellectual Capital Reporting

Intellectual Capital Reporting is the process of creating a story that shows how an enterprise creates value for its customers by using its IC. This involves identifying,

measuring, and reporting its IC, as well as constructing a coherent presentation of how the enterprise uses its knowledge resources. Often this process leads to the writing of an *Intellectual Capital Statement*, a report on the organisation's IC that combines numbers with narratives and visualizations, which can have two functions:

- complement management information (internal management function);
- complement the financial statement (external reporting function).

The main idea behind IC Reporting is that financial information informs about the past performance of the enterprise but tells nothing about its future potential. The future potential of an enterprise lies not within its financial capital but in its IC. Creating transparency about the enterprise's IC will enable it to manage its intangible resources better, give more confidence and motivation to its staff, and provide greater certainty to investors and other stakeholders about its future earnings potential.

The benefits of IC Reporting for research-intensive SMEs fall into two categories: The first category is its potential to function as an internal navigation tool to help develop and allocate resources – create strategy, prioritise challenges to the SMEs development, monitor the development of the SMEs results and thus facilitate decision-making. Within research-intensive SMEs the need to navigate intellectual resources is bigger and at the same time more difficult. From this function follows a second category of benefit, which is the potential of IC Reporting to function as a communication device to the SMEs environment that can be used to attract resources – financial resources, human resources, relationships with partners and customers, and technological resources. This benefit is of extreme importance for research-intensive SMEs because for them it is much more difficult and complex to attract resources.

An IC statement is complementary to a financial statement as it provides insight into important resources that are not found on the balance sheet including knowledge, access to networks, and human resources. An IC Statement is complementary to a business plan as it shows *how* value will be created through R&D and what the role is of the various components of intellectual capital. Therefore it can provide – unlike a business plan – transparency into the hidden value drivers of R&D investments and pinpoint the availability (or absence) of key complementary assets crucial to bring the results of R&D to the market.

Empirical evidence shows that the use of IC Reporting by research-intensive SMEs can help highlight the business case for R&D thus improving access to finance. IC Statements provide more certainty about the situation of the enterprise leading to less variance between appraisers like financial analysts and smaller information asymmetries. This will lead to a better allocation of capital. In the long run this will stimulate extra economic growth because research-intensive SMEs grow relatively faster and are easier established in comparison with traditional firms.

Through its function as a communication device an Intellectual Capital Statement *directly* tackles the problem of market failure in the capital markets for research-intensive SMEs. However, the process of creating an Intellectual Capital Statement will help management to better understand its own business, which will help to improve their dialogue with investors. This *indirect* contribution of Intellectual Capital Statement is just as important as the direct contribution.

Existing regulations and guidelines

Existing regulations on the treatment of IC (mostly referred to as 'intangible assets') in accounting lead to its only receiving limited recognition on the Balance Sheet; as can be seen from the IAS 38 standard. IAS 38 is a restrictive accounting standard

which would lead to most internally generated intangible assets being immediately expensed. This standard codifies the traditional accounting approach, which defines an asset in such a way as to exclude “assets” that cannot be directly linked to a revenue stream. The standard does not consider the nature of the economic attributes across the different types of intangible investment and the potential relevance of this information to the firms’ stakeholders.

However, in this area there are some interesting developments in Germany, Denmark and Austria. In Germany the GAS 12 standard contains a recommendation that companies report about their IC in the management report, although this is not an obligation. In Denmark there is a requirement that companies disclose in their management report information on their IC, if this is a relevant aspect of their economic activity. In Austria IC Reporting is mandatory for all universities as of January 1st, 2006. Of special interest to Europe are recent developments in Australia and Japan. In Australia a *Society for Knowledge Economics* was established in June 2005 following a mandate from the Australian government, which includes among others CPA Australia, the Institute of Actuaries of Australia and Microsoft Australia. The Australian government believes that the knowledge-based economy requires new business models, management skills and organisational practices. The first task of the Society was to develop Guiding Principles on Extended Performance Management aimed at the management and reporting of intellectual capital. In Japan a governmental Subcommittee on Management & Intellectual Assets has proposed a

Origin	Name	Key Focus	Benefits	Links
Austria	ARC ICReport	Structured presentation of goals, potentials, processes, and resuming intangible & tangible results.	Holistic view on the “intellectual status and current ‘value’” of the organization. Justification of tax payers’ investments in public R&D	www.arcs.ac.at/publik/fulltext/wissensbilanz/ARCS_Wissensbilanz_1999.pdf
Denmark	Danish Guidelines	Portfolio of, investments in, and effects of knowledge resources. Relates practices and purposes of IC resources	Supports management and reporting of IC. Develops IC indicators. Identifies properties of IC statements for analysis and benchmarking.	www.videnskabministeriet.dk/icaccounts/
Europe	MERITUM	Differences between intangible resources and intangible activities	Supports management and reporting of IC. Provides a set of characteristics that indicators should have	www.uam.es/meritum
France	IC-dVAL®	Performance indexes and value of IC	Support management and IC Reporting Building sense of IC Internal and external signalling of value and performance for IC	www.icforcommunities.com
Germany	Wissensbilanz	IC processes	Supports management decision making	www.akwissensbilanz.org
Iceland	PIP project	Indicators	Harmonized indicators that allow for benchmarking	http://nhki.si.is/
Spain	Intellectus Model ®	Dividing IC into its minimum components	Adaptability to each organisation	http://www.ofenhandwerk.com/oklc/pdf_files/K-4_deCastro.pdf
Sweden	IC-Rating™	IC position	Visibility of IC, finds areas to improve and enables benchmarking	www.intellectualcapital.se

new model for the voluntary reporting of intellectual assets. In its interim report the committee specifically states that the goal is to arrive at regulatory disclosure of IC related information. The decision to publish a Japanese model now is motivated because this “(...) will have a big impact in the worldwide trend. Also it may be possible to set a de facto standard.” (Subcommittee on Management & Intellectual Assets, 2005).

Across Europe several guidelines have been developed that offer help on how to draw up an IC Statement (see box on previous page). These guidelines are adapted to local circumstances and business culture and differ from one to another with respect to their orientation (internal versus external reporting) and methodology.

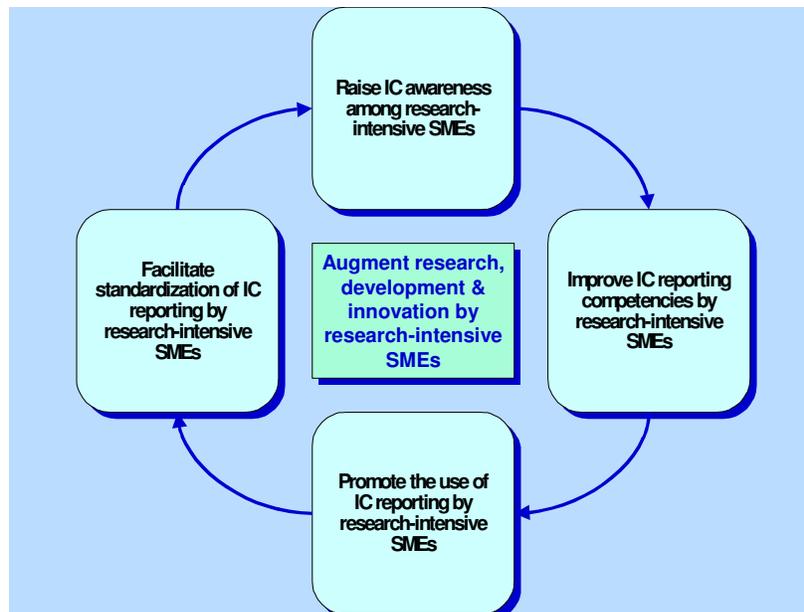
Differences in adoption of Intellectual Capital Reporting

Despite the existence of a variety of useful IC guidelines, it is clear that take up is very patchy with some success stories in for example some of the Nordic countries but in most areas a culture of IC Reporting has yet to appear. An important aspect though is one of terminology because the mere act of planning – which is widespread within SME’s in general and research intensive SME’s in particular – does mean that aspects of IC reporting will be practiced as part of the planning process but not thought of or referred to as IC Reporting. A key task is therefore to highlight the importance of intangibles in making best use of existing planning processes and there is much within the range of existing IC guidelines which can help SME’s to make better quality investment decisions. In companies where knowledge sharing and teamwork is important we would expect IC Reporting to be welcomed, as an integral part of the planning process, providing it is based on practical, flexible and easy to follow guidance (“ready to use templates” for example) which is identified by the SME’s as basic common sense.

Policy options to stimulate IC Reporting

Adoption of IC Reporting will help mitigate the difficulties encountered by research-intensive SMEs to find financing for their research and innovation projects and thereby contribute significantly to augmentation of research investments in Europe. Part of the well-identified market failures in the financing of research and innovation by research-intensive SMEs is due to a lack of transparency into their intellectual capital and complementary assets. The use of IC Reporting as a management and reporting tool can help to counter these failures. Creating more transparency, both externally and within enterprises, about the role of intellectual capital and complementary assets in successful innovation will lead to a better understanding of value creation by research-intensive SMEs and provide a better basis for decision-making to managers and investors.

Stimulating IC Reporting requires an approach from the European Commission aimed at a process of coordination and convergence of guidelines that will empower national policies and will allow translation and adoption in the various member states at different speeds. Common in all national approaches must be the sequence starting from the internal implementation of IC awareness, followed by improving IC Reporting competencies and IC management routines that provide the basis for the use of IC Reporting. As SMEs learn how to make the best use of their intangibles and prepare relevant IC Statements, an important step towards more effective management behaviour will have been achieved. As IC Reporting is spread among research-intensive SMEs the standardization of IC Reporting can be facilitated.



A concerted effort to augment R&D in research-intensive SMEs

The Expert Group considers governmental policy initiatives in these four areas necessary because the capital markets for funding research and innovation of research-intensive SMEs do not perform well and research-intensive SMEs often do not possess the competences to develop and highlight the business case for R&D. Furthermore, standardisation and diffusion/dissemination of IC Reporting are important policy tasks when coordination failures do not lead to well functioning of markets, resulting in lack of transparency. In the field of IC Reporting diffusion and standardisation are very important and can be interpreted as a framework condition, as they help to reduce the risk. Furthermore, the support of competence development and investments in IC is vital as these complementary investments are important to become a successful innovator¹. Finally the Expert Group feels Europe should stay in the lead in the proliferation of IC Reporting and the development towards global standardization of IC related information. The recent developments in Japan and Australia call for a concerted effort on short notice.

The Expert Group has formulated six policy recommendations that can be seen as options for the Commission to practically address improved identification, measuring and reporting of intellectual capital as intended by Commission's Communications on Investing in Research: an action plan for Europe COM[2003]226 and the Communications on business-related services COM[2003]747. Together these steps will create an upward spiral boosting financial capital for, and investments in R&D by research-intensive SMEs.

The recommendations draw partly from earlier work done for the Commission on increasing the transparency of IC, especially the recommendations provided by the PRISM project (PRISM, 2003) and the Study on the Measurement of Intangible Assets and Associated Reporting Practices (Zambon, 2003). These recommendations support and expand ongoing activities and actions of the Commission, especially those related to the 3% action plan (COM[2003]226), related

¹ See also Bessant and Dodgson (1996) who argue that innovation policy should address the capability gap of firms.

to business related services (COM[2003]747), the forthcoming Research and Innovation action plan, and i2010 (SEC[2005]717).

The following table provides an overview of the six policy recommendations of the Expert Group listen the actions, the actors and the rationale for the activities.

WHAT SHOULD BE DONE?	WHO ACTS?	WHY SHOULD THEY ACT?
1. Establish an European Adoption Task Force that oversees and catalyses the development of IC Reporting and management in research-intensive SMEs and acts as a learning platform. The Adoption Task Force should work on three work packages: 1. Raise IC awareness among research-intensive SMEs 2. Improve IC reporting competencies by research-intensive SMEs 3. Promote the use of IC reporting by research-intensive SMEs	<ul style="list-style-type: none"> European Commission 	<ul style="list-style-type: none"> To maximise the speed by which practices spread across European settings: To facilitate mutual learning between member States on prototyping experiments To maintain momentum in developing IC in research-intensive SMEs To help sharing practices between member states To show good practices and develop ambitions for IC Reporting towards convergence of methods
Work Package 1: Raise IC awareness among research-intensive SMEs		
1.1 Promote existing guidelines and increase awareness	<ul style="list-style-type: none"> European Adoption Task Force Member States 	<ul style="list-style-type: none"> To increase awareness of IC, complementary to ongoing activities to increase awareness about appropriate use of risk capital To leverage what already has been achieved on IC Reporting in the EU
1.2. Develop an IC Portal	<ul style="list-style-type: none"> European Adoption Task Force Member states 	<ul style="list-style-type: none"> To increase awareness To facilitate the sharing of best-practices
1.3. Create an IC Reporting Award for countries, regions, enterprises and persons	<ul style="list-style-type: none"> European Adoption Task Force Member States Business associations News papers / media Universities / business schools 	<ul style="list-style-type: none"> To create awareness of good practices. To support those SME who are willing to act as frontrunners
1.4. Motivate specific industries that involve a lot of research-intensive SMEs to adopt IC Reporting (e.g. software industry)	<ul style="list-style-type: none"> European Adoption Task Force Business associations 	<ul style="list-style-type: none"> To engage with specific business associations and use them as leverage to stimulate adoption
Work Package 2: Improve IC reporting competencies by research-intensive SMEs		
1.5. Act as catalyst in the development and inclusion of state-of-the-art IC management and reporting modules into science, engineering and business schools curricula	<ul style="list-style-type: none"> European Adoption Task Force Member states 	<ul style="list-style-type: none"> To ensure that every student – especially from business – receives basic awareness/ training regarding IC management and reporting To complement ongoing intellectual property awareness and training activities
1.6. Support (examined) IC Guides initiatives. IC Guides are people that can help enterprises use IC Reporting	<ul style="list-style-type: none"> European Adoption Task Force Member States Business associations 	<ul style="list-style-type: none"> Develop expertise and help for research-intensive SMEs To find and educate IC Guides
Work Package 3: Promote the use of IC reporting by research-intensive SMEs		
1.7. Establish prototyping activities with research-intensive SMEs in EU countries	<ul style="list-style-type: none"> European Adoption Task Force takes initiative and coordinates together with Member States, possibly supported by the new OMC-net. 	<ul style="list-style-type: none"> To develop practices and awareness in the research-intensive SME segment and to share best practice all over Europe

WHAT SHOULD BE DONE?	WHO ACTS?	WHY SHOULD THEY ACT?
1.8. Increase the role of banks, investors and infomediaries through networking activities	<ul style="list-style-type: none"> • European Adoption Task Force • Business associations • Professional associations 	<ul style="list-style-type: none"> • To complement current actions to improve access to finance with IC Reporting. • To include IC in rating systems that enable potential investors to appraise the risks and rewards associated to investments in research-intensive SMEs
2. Produce a practical guide on IC Reporting for research-intensive SMEs, banks, investors and infomediaries	<ul style="list-style-type: none"> • European Commission 	<ul style="list-style-type: none"> • Show research-intensive SMEs in an easy-to-understand way how IC Reporting can benefit their business
3. Use IC Reporting as an important criterion for public support	<ul style="list-style-type: none"> • European funding mechanisms and financing institutions should take the lead and act as first mover 	<ul style="list-style-type: none"> • To improve the quality of investment proposals by research-intensive SMEs • To create awareness about potential of IC Reporting amongst investors and analysts
4. Apply IC Reporting as a tool for government agencies	<ul style="list-style-type: none"> • European Commission • Member States 	<ul style="list-style-type: none"> • To set the right example • To improve the management of government agencies
5. Commence further research (from the very beginning, impact should be analysed after 2 years) : e.g. research on new business models dynamics and the importance of IC; research on IC for nations, regions, cities and other emerging communities	<ul style="list-style-type: none"> • European Commission • Universities and business schools • Applied science researchers 	<ul style="list-style-type: none"> • To facilitate the learning from using IC Reporting in practice • To develop an understanding of the systemic drivers of the IC development • To spread practices systematically • To develop a systematic knowledge base • To test IC Reporting • To find a scientific legitimate base for investments in IC (R&D) • To support future managers to understand to importance and the handling of IC
6. Set up an International Standardization Steering Group to facilitate the development of consensus-based standardization of taxonomies, indicators, and IC statements for research-intensive SMEs and help develop XBRL standards	<ul style="list-style-type: none"> • European Commission, preferably together with OECD, USA, and Japan • Business associations • Professional associations • Accounting bodies • XBRL system governing bodies 	<ul style="list-style-type: none"> • To initiate that the standards on IC Reporting be developed by organisations that represent different stakeholders as well as the users of IC reports • Contacting the XBRL system governing bodies with the aim of developing a prototype for IC items
7. Encourage the Banks to develop new forms of finance for research based SME's	<ul style="list-style-type: none"> • EU Finance Ministers possibly in conjunction with the EIB • Banks • Regulatory Bodies 	<ul style="list-style-type: none"> • Lending by Banks based on small margins over cost of funds does not allow the Banks to provide support for any but the least risky needs of research intensive SME's. • Examples of good practice of innovative lending amongst the banks and need to be identified, highlighted and disseminated. • Encouraging banks to focus on IC will help the banks to better align what they do to assist wealth creation amongst research intensive SME's. It will also send a powerful message to research intensive SME's who are seeking support from banks, by requiring a credible plan for value creation through which the importance and relevance of IC is properly explained.

1. Introduction

1.1 Background

1.1.1 Intellectual Capital Reporting by research-intensive SMEs

In December of 2004 the Directorate General for Research and Technological Development (DG Research) of the European Commission, set up a High Level Expert Group to propose a series of measures to stimulate the reporting of IC in research-intensive Small and Medium-Sized Enterprises (SMEs) (see Appendix A). Although IC is the hidden driver of the Knowledge-based Economy, because it is not included in the traditional accounting model it is mostly ignored in the decision-making process for investments in Research and Development (R&D). Creating greater transparency in the process of identifying and reporting IC can improve the quality of the dialogue between investors and research-intensive SMEs as well the internal process of managing resource allocation and augment the finance available to carry out R&D and innovation.

IC has been defined as the combination of an organization's Human, Organizational and Relational resources and activities (MERITUM, 2002). It is like the roots of a tree that allow the tree to grow, now and in the future (see Figure 1). A more detailed definition of IC will follow below.

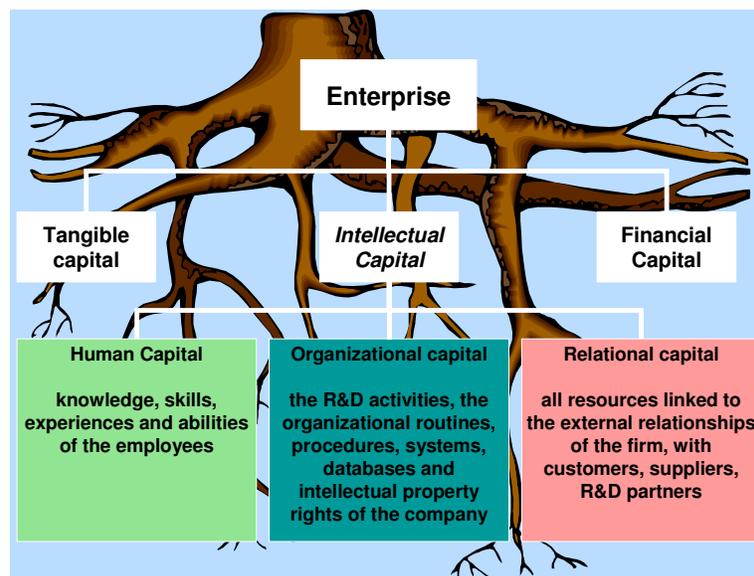


Figure 1 The Intellectual Capital roots of the enterprise

DG Research recognizes the vital role that SMEs play in creating sustainable growth in the EU. SMEs are increasingly considered to be the powerhouse of Europe's economy. They account for 99.8% of the total number of companies, for two-thirds of employment and nearly 60% of value added (TERSTI, 2003). Therefore, DG Research has asked the Expert Group to focus on research-intensive SMEs. The overall objective was to identify on the one hand a number of recommendations to research-intensive SMEs and private stakeholders (financial organizations, accounting and other business organisations) and, on the other hand, public policy options to stimulate research intensive SMEs to develop an IC Reporting culture.

1.1.2 *Innovation, R&D and the Knowledge Economy*

The economy is rapidly becoming a global marketplace characterized by fierce competition, increasing consumer demands and the need for value added products and services. The only way for enterprises to survive in this Knowledge-based Economy is to differentiate themselves by continuous innovation in order to improve their processes, products, services, networks and reputation.

Enterprises innovate in many different ways, ranging from *technological product innovation* based on new knowledge generated by in-house basic research and via innovation by applied research, to *marketing innovation* based on existing models and concepts. Innovation may involve the generation of knowledge that is new to the world through R&D activities and it can be based on existing knowledge that is only new to the enterprise. R&D can be done in-house, or alternatively results of R&D can be in-sourced from specialized Research & Technology Organizations or Universities.

Knowledge plays a vital role in all these various types of innovation, which is why the Lisbon European Council in March 2000 has set the objective of making Europe the most dynamic Knowledge-based Economy in the world. The central role of knowledge was restated by the High Level Group on the Lisbon strategy, chaired by Wim Kok, which recommended the realisation of the Knowledge-based Economy as the top priority for the EU.

The European Council of March 2005 has re-launched the Lisbon strategy by refocusing on growth and employment in Europe, striving for strengthening competitiveness by investing above all in knowledge, innovation and Human Capital in order to raise the potential for economic growth. Knowledge, accumulated through investment in R&D, innovation and education, is a key driver for long-term growth. Policies aimed at increasing investment in knowledge and strengthening the innovation capacity of the EU economy, are at the heart of the Lisbon strategy for growth and employment.

1.1.3 *The challenges of R&D*

Because of the important role in innovation of the generation of new knowledge through R&D, the Barcelona European Council in March 2002 set the target of raising the European research effort to 3% of the EU's GDP and proposed that two thirds of this should come from increased funding of research by the private sector. This target was reconfirmed at the March 2005 European Council. To become a genuinely competitive, Knowledge-based Economy, Europe must become better at producing knowledge through research, diffusing it through education, and applying it through innovation.

R&D has been defined as consisting of creative work, undertaken on a systematic basis, in order to increase the stock of knowledge, including knowledge of man, culture and society, and the use of this stock of knowledge to devise new applications (OECD, 2002). Europe has two challenges when it comes to improving the role of R&D in innovation. The first is to increase the total amount of creative work undertaken. The second is to improve the new knowledge's productivity, through application and innovation, by generating value.

In order to increase the total amount of creative work undertaken, Europe needs an increase in financial investments in R&D, not only by the public sector but also from within enterprises and by attracting investment by outside investors. However, investing in the innovation-creativity process is inherently risky (Lev, 2001). Often, only a small number of R&D activities are successful in creating value. Furthermore,

it is frequently difficult to exclude other enterprises from enjoying the benefits from a company's investments in R&D, because it is difficult to 'protect' knowledge.

Realizing the full benefits from new knowledge and new technologies depends critically on the diffusion and application of these technologies throughout the economy. In order to improve the productivity of new knowledge in generating value, enterprises need to take into consideration the whole value constellation sitting between R&D and the end users, whose purchases underpin the value creation process. Not only the amount and quality of the R&D is important, but also the packaging of the fruits of R&D into products and services which meet the needs of end users.

1.1.4 Intellectual Capital Reporting and R&D

IC plays a vital role in the creation of value through R&D. First, R&D is an activity that *creates* IC in the form of knowledge. Second, to create value from the fruits of R&D, enterprises need IC in the form of complementary assets. According to Teece (2000, p. 25), "Complementary assets matter because knowledge assets are typically an intermediate good and need to be packaged into products or services to yield value". Typically, the design of a new car is without any value without production, marketing, distribution, servicing and even complementary financial assets.

Therefore it can be said that IC is the product of combining the products of R&D with the complementary assets that result in value creation. However, not many enterprises systematically analyse, manage, measure, and report their IC. This underexposure of their IC might lead to a bias in the allocation mechanism of the financial markets towards traditional sectors rather than research based businesses. It might also lead to a bias in the internal allocation mechanism within companies.

In the Communications on Investing in Research: an action plan for Europe COM[2003]226 and the Communications on business-related services COM[2003]747 the European Commission intends to address this issue of improved identification, measuring and reporting in order to overcome the present lack of reliable information about the intellectual capital of a company. This is especially relevant for research-intensive SMEs that often are IC intensive but have less means compared to larger enterprises to convince investors about the value of their IC.

Although a wide range of methods for measuring and reporting IC have been developed during the last decade, especially for internal managerial purposes, the take up in companies is still quite low. Articulating the value of IC is problematic and therefore attracting capital for investments in IC is much harder to achieve than doing so for investments in tangible assets. Investors are reluctant to invest in IC because of its inherent high-risk nature. Since IC is now the main driver of value creation and growth, this negative investment bias is seen as harmful, particularly for research-intensive and innovative enterprises.

By improving transparency, IC Reporting can strengthen the business case for R&D in two ways. First, IC Reporting can help research-intensive SMEs to improve their understanding of the value constellation of R&D, the drivers of value creation and the important role of complementary assets, thus improving the *quality* of the business case for R&D. It makes the management of the research-intensive SMEs' intangibles a conscious and deliberate exercise, so that objectives and actions are developed and implemented with a view to growth and effectiveness. The impact on the internal management of the research-intensive SME and its ability to attract relevant resources is important in an intangible economy where the question of what management really is, is still relatively unknown. The IC statement can make research-intensive SMEs more professional in their approach to managing the business. The process of creating an IC statement often proves to be a very fruitful

learning experience for the management of research-intensive SMEs, one that also helps the company to align various views on the enterprise that might exist within itself.

Second, IC Reporting can help improve the dialogue between investors and investees, improving the *cogency* of the business case for R&D and thereby improving access to finance. It communicates revealing information about the enterprise's intangible resources: It contributes to transparency in the business model and it provides information about the activities of research-intensive SMEs to develop and exploit them. In this way, the IC statement makes complex resources, such as competencies and relationships, visible; thereby reducing risk and uncertainty to internal as well as external stakeholders. When the IC statement presents the constellation of intangible resources it draws up a balance sheet of resources not previously visible. This in turn reduces uncertainty about the resources that play a key role in the enterprise's operations.

IC Reporting can improve the quality as well as the cogency of the business case for R&D, but the latter will not happen without the first. The internal purpose of IC Reporting (improving the quality of the business case) and the external purpose of IC Reporting (improving the dialogue with investors) go hand in hand. In order to be convincing, an IC statement needs to be truthful. Using IC Reporting merely for window-dressing will not work.

Through its function as a communication device an Intellectual Capital Statement *directly* tackles the problem of market failure in the capital markets for research-intensive SME's. However, the process of creating an Intellectual Capital Statement will help management to better understand its own business, which will help to improve their dialogue with investors. This *indirect* contribution of Intellectual Capital Statement is just as important as their direct contribution.

1.1.5 RICARDIS

In December of 2004 the Directorate General for Research and Technological Development (DG Research) of the European Commission (EC), set up a High Level Expert Group (HLEG) to propose a series of measures that could stimulate reporting of IC in research-intensive SMEs. The establishment of this expert group was based on the action "Encourage corporate measuring and reporting on research and other forms of intellectual capital" that was announced in the Communication Investing in Research, an action plan for Europe COM[2003] 226.

The acronym RICARDIS reflects the objective of the High Level Expert Group to stimulate **R**eporting of Intellectual **C**apital to **A**ugment **R**esearch, **D**evelopment & **I**nnovation in **S**MEs.

Via a combination of collective and individual work the Expert Group prepared all of the necessary material to enable it to discuss the key issues during a series of meetings and then draw up its conclusions. It has formulated and presented a number of policy guidelines and recommendations in this Final Report, which includes all of the relevant background analysis and findings of the Expert Group's work. The composition of the High Level Expert Group can be found in Appendix A.

1.2 Objectives of RICARDIS

The Expert Group was asked to identify on the one hand a number of recommendations to research-intensive SMEs and private stakeholders (financial organizations, accounting and other business organisations), and on the other hand public policy options to stimulate research intensive SMEs to report on their intellectual capital. The focus on research intensive SME's was justified by the fact

these are a potential source for future economic growth in the EU (the Nokia's of tomorrow). Currently this group of fast growing research intensive SME's is underrepresented in comparison with the US. These recommendations and policy options will be prioritised according to their expected effectiveness in boosting investment in R&D and will therefore constitute orientations for institutional changes and policy implications at national and EU levels.

The Group was asked to review and assess the definition of research intensive SMEs, the relevant categories of Intellectual Capital, why these are important to research intensive SMEs and the financial sector and how we can stimulate research intensive SMEs to report on their intellectual capital. An overview will be provided of recent initiatives, current challenges, and existing trends, as well as comparative analysis based on a selected number of national case studies.

The Group was asked to consider how its recommendations may be taken forward by Community, Member State or private sector initiatives. The target groups for the work of the expert group are 1) research intensive SMEs, 2) investors and other private stakeholders, and 3) policy makers. For a definition of these three target groups see Appendix D. The deliverables are:

1. Guidelines for research intensive SMEs, on how to highlight the business case for R&D investments by reporting on their intellectual capital.
2. Recommendations for investors and other private stakeholders on how to interpret and value intellectual capital statements and how to encourage companies to report on their intellectual capital.
3. Recommendations for public policy makers on how to stimulate companies to report on their intellectual capital.

The Expert Group deliberately used the term 'guidance' so that different sectors could then define the sets of measures and approaches that would be best adapted to their context and needs. The Expert Group wants this Report to be an invitation to the reader to join the exploration of what IC Reporting can do to improve the business case for R&D. The Group is aware of the fact that IC Reporting is still in its embryonic stages and that no standards have yet been agreed. Experiments are being conducted in many European countries and in Asia and new lessons are being learned everyday. There is still a lot that we do not know, so the Group has been modest in its assertions.

1.3 Scope of RICARDIS

The scope of the work of the Expert Group was limited in several ways:

- The work focused on enterprises that do R&D or that innovate using the results of in-sourced R&D.
- The work focused on SMEs, although the results are also relevant for R&D units within larger companies as well as RTOs.
- The work focused on the reporting of IC and not on other types of capital.
- The work built on existing models, methods and guidelines for the reporting of IC and does not involve the creation of new methods.
- The work focused on Europe.

Each of these boundaries is further described below.

1.3.1 R&D and Innovation

In the so called 'Frascati Manual', research and development (R&D) comprise creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society, and the use of this stock of knowledge to devise new products or services (OECD, 2002).

The term R&D covers three activities: basic research, applied research and experimental development:-

- **Basic research** is experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundation of phenomena and observable facts, without any particular application or use in view.
- **Applied research** is also original investigation undertaken in order to acquire new knowledge. It is directed, however, primarily towards a specific practical aim or objective.
- **Experimental development** is systematic work, drawing on existing knowledge gained from research and/or practical experience, which is directed to producing new materials, products or devices, to installing new processes, systems and services, or to improving substantially those already produced or installed. R&D covers both formal R&D in R&D units and informal, or occasional, R&D in other units.

In the discussion about the borderline between R&D and other industrial activities, the Frascati Manual offers the following rule of thumb (based on the US National Science Foundation): "If the primary objective is to make further technical improvements on the product or process, then the work comes within the definition of R&D. If, on the other hand, the product, process or approach is substantially set and the primary objective is to develop markets, to do pre-production planning or to get a production or control system working smoothly, the work is no longer R&D." (OECD, 2002).

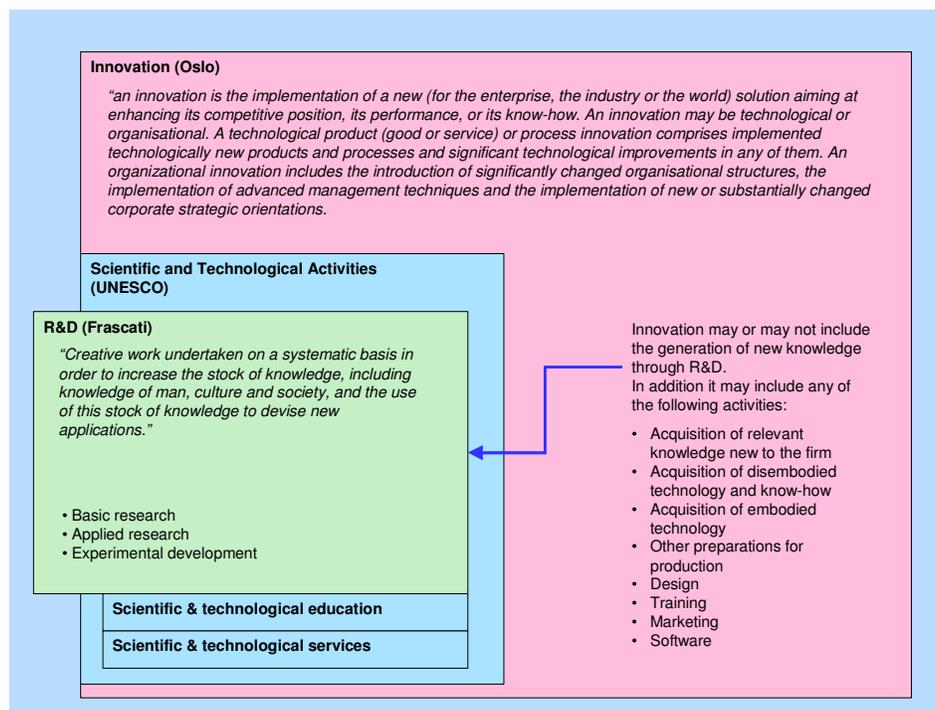


Figure 2 Relationship between R&D and Innovation

UNESCO developed the broader concept of Scientific and Technological Activities (STA) and included this in its “Recommendation concerning the International Standardization of Statistics on Science and Technology” (UNESCO, 1978). In addition to R&D, Scientific and Technological Activities comprise Scientific and Technical Education and Training (STET) and Scientific and Technological Services (STS). The latter services include, for example, S&T activities of libraries and museums, translation and editing of S&T literature, surveying and prospecting, data collection on socio-economic phenomena, testing, standardization and quality control, client counselling and advisory services, patent and licensing activities by public bodies. R&D (defined similarly by UNESCO and the OECD) is thus to be distinguished from both STET and STS.

According to the ‘Oslo Manual’, “an innovation is the implementation of a new (for the enterprise, the industry or the world) solution aiming at enhancing its competitive position, its performance, or its know-how. An innovation may be technological or organisational. A technological product (good or service) or process innovation comprises implemented technologically new products and processes and significant technological improvements in any of them. An organizational innovation includes the introduction of significantly changed organisational structures, the implementation of advanced management techniques and the implementation of new, or substantially changed, corporate strategic orientations.” (OECD/European Commission, 1997).

Figure 2 manifests that R&D is in fact innovation (except when the R&D activity does not lead to new solutions, as indicated by the part of R&D outside of the innovation box), but not every innovation is the result of R&D activities. The basic criterion for distinguishing R&D activities from non-R&D innovation activities “*is the presence in R&D of an appreciable element of novelty and the resolution of scientific and/or technological uncertainty*”. This criterion implies “*that a particular project may be R&D if undertaken for one reason, but if carried out for another reason, will not be considered R&D*”. (OECD, 2002).

Competition that is based on differentiation means that you need to look at the way in which knowledge is applied in innovations, not simply the creation of new knowledge. Hence the importance of Development (as opposed to Research) - the way in which knowledge is translated into products and services which meet customer needs -, and the importance of innovation.

R&D is *all* creative work undertaken on a systematic basis in order to increase the stock of knowledge. R&D can be invisible because it is not recognized as such, which can especially happen in SMEs. IC Reporting can help identify such activities. To an ever increasing degree the R&D value constellation involves a number of different enterprises that are producers or users of knowledge, or both. As a consequence, the complementary assets of one company can be vital for the added value of the R&D of another company. This issue requires special attention in IC reports.

1.3.2 *Research-intensive SMEs*

Small and medium sized enterprises are enterprises that have between 10 and 249 employees, a turnover of up to 50 million € and a balance-sheet total of up to 43 million € (Commission Recommendation - 2003/361/EC). The Expert Group decided to focus on this group of enterprises, but it expects that the findings are also relevant for larger enterprises.

SMEs can be further divided using the following taxonomy, which is based on the taxonomy of the publication Third European Report on Science & Technology

Indicators 2003 (TERSTI, 2003). The taxonomy divides SMEs by the level of their involvement in R&D:

1. High tech SMEs, including start ups. For these SMEs, R&D is a core activity.
2. Medium and Low tech SMEs. These SMEs perform R&D, or outsource R&D, but it is not a core activity.
3. Innovative SMEs who do not perform R&D but who are innovative.
4. Non-innovative SMEs.

The focus of the Expert Group is on the first three types of SMEs for which this report will use the collective term ‘research-intensive SMEs’.

In addition the Expert Group assumes that there are similarities between research-intensive SMEs and R&D units in larger organizations. Large organizations undertake a wide variety of activities. Within large organisations there may be specialist units which undertake activities, often referred to as projects, like R&D and new product development. These types of activity tend to be concentrated in specific parts of the organisational structure and the units involved in this type of activity have to win the resources needed to undertake the work. Whilst large organisations have supporting infrastructures to facilitate budgeting and project appraisal, in essence there is little difference between the information needs of large organisations and the information needs of SMEs. The Expert Group also expects that there are similarities between high tech SMEs and Research and Technology Organizations whose sole purpose is to produce knowledge through R&D. Therefore the Expert Group expects that the results of the Group will also be useful for R&D units and RTOs such as Fraunhofer in Germany, VTT in Finland, TNO in The Netherlands, SINTEF in Norway, ARC in Austria and Tecnalia in Spain.

Both governments and private enterprises invest in R&D. In both cases the capital allocation decisions need to be efficient and rational. Therefore the aim of the Expert Group was to come up with results that would be useful for public as well as private institutions.

Thus, in this report, a less formal, more liberal definition has been adopted by the Expert Group as we not only consider research dedicated SMEs to be the privileged subject of the study, rather than any organisational unit which can be identified to be able to produce IC goods or processes. This may also be a Research & Technology Organisation (RTO), research-intensive SMEs (including Spin-Offs), or Universities and their Technology Transfer Offices, or even distinct units of larger companies that serve as “internal” knowledge / research providers.

1.3.3 Intellectual Capital

Intellectual Capital covers ultimately every one of those items necessary to an organisation’s daily operation in the Knowledge Economy. IC has been defined as the combination of an organization’s Human, Organizational and Relational resources and activities of an organization. It includes its employees’ knowledge, skills, experiences and abilities; the R&D activities, the organizational routines, procedures, systems, databases and its Intellectual Property (IP) rights as well as all of the resources linked to its external relationships; such as with its customers, suppliers, R&D partners, etc (MERITUM, 2002). IC can both be the product of R&D activities and the enabler for creating value from R&D. This combination of intangible resources and activities allows an organisation to transform a bundle of material, financial and human resources in a system capable of creating stakeholder value. Intangibles to become part of the intellectual capital of an organisation have to be durably and effectively internalised and/or appropriated by this organisation.

1.3.4 Existing Guidelines

It was not the intention of the Expert Group to create a new guideline for IC Reporting. Instead it aimed to contribute to the optimal use of existing guidelines and experiences. There are many excellent guidelines available whose further proliferation should be promoted while in the long run convergence of existing guidelines is needed. The Expert Group provides an overview of recent initiatives, current challenges, and existing trends, as well as a comparative analysis based on a selected number of national case studies.

1.3.5 Geographical Coverage

The focus of the Expert Group was Europe, particularly the EU-25. However, several policies and practices in other parts of the world (the US and Japan in particular) were analysed when found relevant for the EU.

1.4 Working Method of RICARDIS

The High Level Expert Group consisted of 14 members so as to provide a variety of views and approaches (see Appendix A). A chairperson prepared the meeting agendas, directed the meetings, organised the work of the members of the group and summarised the main conclusions and actions arising before closing each meeting.

A rapporteur, working closely with the chairperson, prepared the final report of the Expert Group. He highlighted and exploited the main points of the reports presented by the experts and drafted summaries of the discussions held during the meetings. Each member contributed to the Expert Group's work by participating in its meetings, preparing written individual or joint contributions in his or her area of expertise, as agreed with the chairperson, and then presenting them at the meeting, as well as commenting on the contributions of the group members. Commission officials from DG Research, DG Enterprise, DG Internal Market and Services, DG Information Society, as well as the European Investment Bank and representatives of the OECD followed the work of the group and participated in its meetings. In several instances appropriate external experts were invited to participate in one or more of the meetings.

The Expert Group started by exploring the issues and presenting to each other initial ideas and examples of best practices. This resulted in a first outline of an end report, which was commented on by all members. A second version of the outline was used to assign specific tasks and paragraphs to teams of between two and four members. The preliminary results of these teams were discussed during an Expert Group meeting. A draft version of the final report was presented to experts from the three target groups in a workshop setting and the feedback was incorporated in the final version of the report.

The Expert Group would like to thank the guests who participated in the workshops held in June 2005. Their feedback and remarks were valuable for the renewed version of this report, which is presented here. Please refer to Appendix B for the list of their names.

1.5 Structure of the report

The report is structured as follows. Chapter 2 shows how intellectual capital is linked to R&D and what the role and benefits are of Intellectual Capital Reporting. Chapter 3 outlines existing regulations, guidelines and experiences in the area of IC Reporting in Europe and elsewhere. Chapter 4 provides hands-on advice for those who want to start reporting on their intellectual capital and banks, investors and infomediaries who

use the information provided in IC Statements. Chapter 5 gives an overview of the policy recommendation the Expert Group suggests to stimulate the reporting of Intellectual Capital in research-intensive Small and Medium-Sized Enterprises.

2. Linking Intellectual Capital Reporting to R&D

2.1 The role of R&D in SMEs in the EU

2.1.1 *Research-intensive Small and Medium-Sized Enterprises*

In Europe more than 99% of all enterprises are SMEs, which are 19.3 million companies in the European Economic Area and Switzerland (Europe-19) in total (European Commission, 2003a). SMEs are an important driver for economic growth, employment, technological development and structural change. While large enterprises have decreased employment over recent years, SMEs were able to create new jobs. In fact, during the nineties, more than 80% of the new jobs have been created by SMEs. However one has to consider that the downsizing and outsourcing strategies of large firms have influenced this trend. On the other hand, with respect to productivity growth, smaller firms lost some ground in comparison to large enterprises.

Small and medium sized enterprises are firms that have between 10 and 249 employees, a turnover of up to 50 million € and a balance-sheet total of up to 43 million € (Commission Recommendation - 2003/361/EC). The Expert Group has decided to focus on this group of enterprises, but it expects that the findings are also relevant for larger enterprises.

There is a long debate tracing back to the Economist Josef Schumpeter about the role of small and large firms with respect to technological progress and innovation. While during the eighties the pioneering role of large enterprises with their R&D units was stressed amongst academics and policy makers, in the nineties the role and impact of SMEs was rediscovered. The empirical evidence delivers many examples of highly successful innovations, which stemmed from small enterprises, which revolutionised entire industries. Start up companies, young entrepreneurs, university spin-offs and small highly innovative firms, more than often produced major technological breakthroughs and innovations and left behind the R&D efforts and innovation strategies of large global corporations. SMEs serve as important vehicles for knowledge spill-overs; their ideas, competencies, products, strategies, innovations and technologies are often acquired, accessed and commercialised by larger enterprises. They often create new markets and fulfil new consumer demands.

SMEs can be divided up according to the following taxonomy depending on the level of their involvement in R&D (TERSTI, 2003):

1. High tech SMEs including start-ups. For these SMEs, R&D is a core activity.
2. Medium and Low tech SMEs. These SMEs perform R&D or outsource R&D but it is not a core activity.
3. Innovative SMEs who do not perform R&D but who are innovative.
4. Non-innovative SMEs.

For high-tech SMEs, R&D is the core activity, whereas for medium and low-tech SMEs, R&D is important - either carried out internally or outsourced - but it is not the core activity. The focus of the Expert Group is on the first three types of SMEs for which this Report will use the term 'research intensive SMEs'. They are research intensive because they are involved in R&D or make use of the results of R&D in innovation activities.

The membership of a sector can be used to classify an SME as a 'high-tech SME'. According to the latter definition, the Observatory of SMEs accounted about 750.000 SMEs as being active in high-tech industries, such as pharmaceutical, aeronautics, and telecommunication sectors in 2000; which are approximately 4% of all enterprises. In this context, it is of interest to note that, in general, the largest part of R&D activities in the economy is concentrated in these industries. Although the direct impact on the entire economy is limited with respect to employment, the indirect effects as generated by knowledge spill-overs are quite large.

Rothwell and Dodgson (1998) separate SMEs in 'technology start-ups', which account for about 2% of all SMEs and 'leading technological users' with or without sufficient R&D capacity, which are about 10 to 15%. 'Leading technological users' are an interesting group as they have sufficient absorptive capacity and they adopt new technologies for specific customer applications and markets. Finally, 'technological followers' are the third and major group of SMEs, which passively adopt new technologies. The latter group is split up by Prince (1998) in the group of 'potential innovators' and 'non-innovators'. Potential innovators are enterprises which are characterised by a strong customer orientation, the recruitment of highly qualified employees, the willingness to co-operate with other partners and have successfully introduced a new product in the past². However, this type of enterprise does not invest in R&D but have the potential to become an R&D-based enterprise.

The Innovation Scoreboard 2004 finally distinguishes five innovation modes based on the CIS (Community Innovations Surveys) findings (European Commission, 2003b). For 'strategic innovators' R&D and innovation is the core activity, for 'intermittent innovators' innovation and R&D are important, but not the core business, 'technology modifiers' modify their products and processes by non-R&D based activities, and 'technology adopters' innovate by adopting and imitating innovations from other enterprises. Non-innovators relate to those organisations which do not invest in qualifying R&D.

It is important to keep in mind that these different groups of SMEs have specific characteristics, strengths, development stages, barriers and problems; each of which have to be addressed specifically. Clearly, many SMEs are the prototype of firms which are innovative without carrying out formal R&D. The acquisition of external R&D, co-operation with suppliers, customers and research organisations, and the innovative adoption and combination of machinery and equipment, are among the most important innovation strategies of SMEs. Furthermore, it is obvious that SMEs are a very heterogeneous group, which follow different strategies influenced by the national and regional context.

2.1.2 Research and Innovation

Innovation is important to all enterprises, whatever their size and in whatever sectors they operate. Enterprises compete with each other to come up with new and better ways to meet existing and evolving customer needs. Some changes are incremental while some are more radical, but enterprises that don't invest in the future simply do not survive.

There are many types of innovation but they all revolve around the successful implementation of a new solution aimed at enhancing competitive positioning, capabilities or performance. Innovation includes: new products and services; the implementation of new processes, ways of working and organizing; or the development of new markets.

² Classifications like this are also often used to develop specific innovation policy measures.

Knowledge provides the key building blocks for innovation and may arise from day-to-day activities and experiences, extraordinary events, or from experiment and research. It may arise within the enterprise, or from external contact with clients, suppliers, new employees, universities, specialist research enterprises etc. Basic building blocks of innovation include:

- **Research and Development** – the focus here is on scientific research and technical development, to understand how things work and to package this understanding into useful knowledge.
- **Market Research and Product Development** – to understand the marketplace, what the market wants and needs, for the purpose of developing new products, processes and services which create value for customers.
- **Operational Research** – the science of management, using mathematics and engineering to improve the way in which each aspect of a business performs and to re-design businesses processes to meet its strategic objectives.
- **Developing People** – providing people with the opportunities to learn and apply new knowledge, experience, skills and competencies in ways which benefit the enterprise both now and for the future.
- **Developing Relationships** – building, storing and maintaining a useful picture of customer, alliance partner and other stakeholder needs and desires in order to build profitable and lasting relationships based on a win-win style of doing business. This includes also the development of brand and image through marketing activities.

Though highlighting the fact that R&D and innovation is not without risk, failure to invest for the future should be seen in the long term as being even more risky. “Innovate or die” is a phrase which serves to remind us that, in the context of competition with low cost economies and very little control over the transfer of knowledge around the world (the unseen and intangible balance of payments), that we need to focus on the need to invest in the continual improvement of all that we do.

There is however a vast difference between a large established, enterprise – with an array of production and market orientated complementary assets – undertaking research to produce a flow of new products, processes and services to feed into its production and distribution networks, and an SME in the process of developing a single new product, process or service with little in the way of the market orientated resources required to develop a sustainable market niche.

Large enterprises, with their spread of activities, entrepreneurial experience, market position and financial strength, are inevitably considered less risky enterprises than SMEs and this means that the cost of capital and cost of borrowing is much higher for SMEs than for large enterprises.

2.1.3 Investments in Innovation

Studies such as the Community Innovation Surveys (CIS) provide information about investments in R&D and innovation in small and large firms in different sectors across Europe. Thereby, R&D expenditures still often serve as a surrogate for investments in innovation. Hence, R&D and innovation activities of SMEs are underestimated since the innovation related activities of SMEs are often informal. Within innovation surveys, innovation outputs are usually measured by the number of new products launched in markets or the turnover achieved with products not older than 3 years.

CIS studies and similar surveys at the national level show that the expenditures in R&D and innovation and innovation output, increase with firm size. According to the recently available CIS 3 data, 40% of small firms (10-50 employees), 63% of medium-sized firms (20-250 employees) and 80% of all large firms in manufacturing sectors are innovative – measured as a percentage of firms which implemented a product or process innovation within the last three years, independently of whether or not this was successful (European Commission, 2003b). The amount of innovation in services is about 10% lower on average in the size classes.

Among the group of innovating SMEs, about 60% carries out internal R&D activities (intramural R&D) and about 30% are engaged in external R&D. The data also show that besides process and product innovation activities, SMEs often implemented important strategic or organisational change measures. When considering the R&D or innovation expenditures in relation to the turnover, some studies also deliver evidence that innovative SMEs invest relatively more in R&D than their larger competitors. According to CIS 3, the innovation expenditures (as a percentage of turnover including expenses for internal and external R&D, acquisition of machinery, licences and training) of small innovative firms are 4.1%, of medium-sized firms 2.7% and of large firms 3.1%. Moreover, research- and innovation-intensive SMEs also have a stronger international orientation and higher export rates than non-innovative SMEs because domestic markets are often not sufficient to achieve the necessary returns on the R&D investments. In Figure 1 some important indicators of innovation and research activities of small-, medium and large firms, based on data for the recent CIS-3 study, are summarised.

Clearly, the innovation patterns and investments in R&D and innovation are dependent on the sector. In this context, for instance, one can separate them into industries where knowledge creation is crucial, characterised by the necessity to perform R&D in-house and patent inventions, such as in the case of chemicals and electronic components. In contrast, in sectors such as transport equipment and food, the diffusion of knowledge is important. Here co-operation and investments in machinery and equipment are crucial (European Commission: European Innovation Scoreboard 2004).

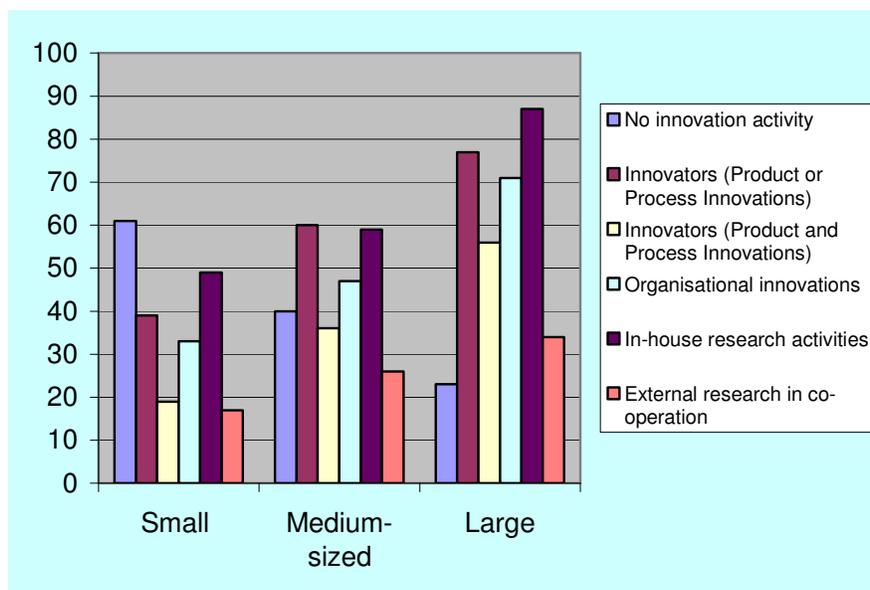


Figure 1: Innovation and research activities by European firms (EU-15) in manufacturing and services in % of firms. Source: CIS 3 (1998-2000)

2.1.4 *Impact of innovation*

Innovation studies have investigated the economic impact of R&D investments and innovation related activities of small and large enterprises. In general, most studies found that R&D and innovation have a positive impact on productivity, profits, sales, and employment growth. The latter one is the most difficult issue to study since innovations have compensation and displacement effects. In general, process innovations of enterprises deliver only temporary advantage. Whereas positive potential net effects of process innovations tend to be reduced in the long run, when new competitors match the innovations, positive potential net effects of product innovations tend to be persistent.

A closer look at high-tech SMEs shows that only a very small group of those in high-tech sectors grow very fast. The main job engine thus stems from a few high-tech services such as ICT-related services. Moreover, the variation of performance amongst high-tech SMEs is quite large, which reflects the risky character of R&D and innovation. Nevertheless, on average, innovative SMEs generate more jobs, are more productive, and are more profitable than other SMEs.

Research-intensive SMEs are characterised by several factors and follow specific innovation strategies. Very often they are specialised as suppliers and niche players. SMEs have specific advantages with respect to innovation and technological competition: Entrepreneurial spirit, flexibility, non-bureaucratic decision making structures, motivated and trained employees they usually operate in attractive niche markets, are important pillars of their competitive advantage and have the ability to develop new products and services. Carrying out in-house R&D activities, both formal and informal, and developing close relationships with customers and suppliers are important prerequisites for SMEs' innovation performance. Based on the taxonomy of R&D and innovation intensity of SMEs as presented above, it becomes obvious that the regional and national context which provides the co-operative environment for carrying out R&D and innovation in-house, or in co-operation, is important. Thus, large technology-based enterprises, universities, and research organisations, are important players that determine the extent and potential for innovation activities of SMEs.

2.2 The role of R&D and IC in value creation

2.2.1 *Intellectual capital*

In the knowledge-based economy, successful innovations require various kinds of intangible investments. These investments produce intellectual capital (IC). Intellectual capital has been defined as the combination of the Human, Organizational and Relational resources and activities of an organization. It includes the knowledge, skills, experiences and abilities of the employees; the R&D activities, the organizational routines, procedures, systems, databases and intellectual property rights of the company; and all resources linked to the external relationships of the enterprise, such as with customers, suppliers, R&D partners and etc.

Different taxonomies for IC have been proposed since the mid 1990s. As far as R&D and innovation is concerned, IC should be considered in a broader framework. Two types of IC can be distinguished (Bounfour, 2005) (Figure 2):

- 'Autonomous' intellectual capital (A) is less dependent on people and consists of those assets with a secondary market like patents, brands, software etc. (A-1), and those without a secondary market such as methodologies, reputation, image etc. (A-2);

- ‘Dependent’ intellectual capital (B) is more dependent on people and consists of innovation capital (B-1), informational and organisational capital (B-2), marketing & distribution capital (B-3), and relational capital (B-4). These resources are considered as dependent because of they are embedded in the corporate organisation and are therefore of an inseparable nature.

From this figure, we can derive how complementary assets can complement other IC categories, especially those considered as knowledge intensive (A-1, B-1). Those complementary assets suggested here as internal (B-2, B-3 and B-4) might also be found in the external boundaries of the enterprise and those complementary assets presented here as external might also be internalised, depending upon the context of the SME and its positioning within the value constellation model.

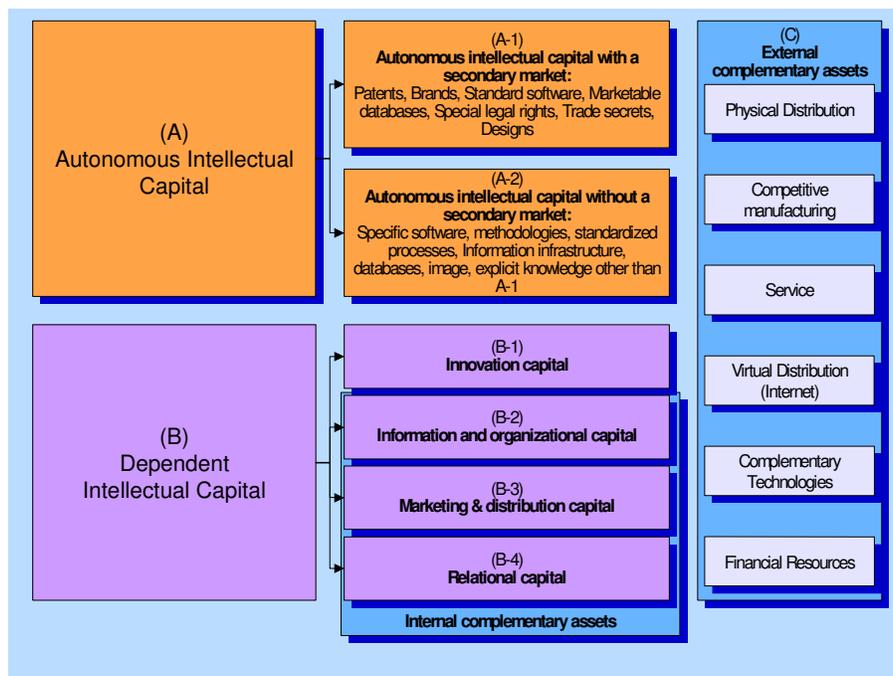


Figure 2: Typology of IC resources (Bounfour (2005), adapted by the author)

From this typology, we can derive several arguments regarding managing and reporting IC in the field of R&D and innovation:

- Investments in IC (including R&D) are important components of those resources embedded within companies;
- The performance of R&D (and innovation) resources depends upon their level of integration with other intangible resources (B2, B3 and B4), that should be considered here as “complementary assets” to R&D per se;
- Enterprises are naturally interested in the value they can derive immediately from the “autonomous” intangible resources, but also from the interaction (bundling), they can organise between autonomous resources and dependent ones. This naturally has (should have) an impact on how to report on IC.

2.2.2 Intellectual capital, R&D and innovation

Intellectual Capital is about future earning potential. Theoretical and empirical studies show that it is the unique combination of the several elements of IC and tangible investments that determines the competitive advantage of a firm. R&D and innovation can be regarded as one element of IC. However, research-intensive firms do not only invest in R&D and innovation but also in other forms of intellectual capital. Econometric and empirical studies deliver evidence for the tight link and contingency between investments in R&D, innovation, human resources and relational capital and its impact on economic and innovation performance (e.g. Ballot et al. 2001, Romer 1990) Innovative and research-based SMEs put more emphasis on human capital, competence development, and co-operation in comparison with less innovative SMEs.

2.2.3 Human Capital

Baldwin and Johnson (1996) found evidence that more-innovative enterprises offer more formal and informal continuous training and have more innovative compensation packages. While almost three-quarters of the group of more-innovative enterprises offer some form of training, just over half of the group of less-innovative ones are engaged in training. Baldwin and Johnson deliver also empirical evidence that human resources, marketing, and strategic management are important for innovation success, and that more-innovative enterprises take a balanced approach to their business' operation by striving for excellence in a number of different areas.

Laursen and Foss (2000) conclude that the application of HRM practices does matter for the likelihood of a firm being an innovator. Hughes (2001) found that innovative firms address broader fields of topics and categories of staff with respect to their competence development activities. Michie and Sheehan (1999) suggest that 'low road' HRM practices characterised by short-term contracts, etc. are negatively correlated with investment in R&D and new technology, whereas 'high road' work practices are positively correlated with R&D investments and the introduction of new technology. Obviously, HRM practices influence innovation performance, e.g. new HRM often increase decentralisation, in the sense that problem-solving rights are delegated to the shop floor, which might facilitate the discovery and utilisation of local knowledge and thus enhance innovation.

2.2.4 Relational Capital

Relational capital – like co-operation, informal knowledge transfer, networking, and brand capital – is also important for the innovation success of SMEs. Customers are the most important external sources of information for innovation, followed by suppliers and competitors. Traditional sources such as fairs, exhibitions, conferences, etc. are also important. The benefits from R&D co-operations are associated with the capability of enterprises to undertake R&D. Thus, cooperation seems to be a complement to internal technical competence building in combination with the company's ability to absorb the results of R&D.

2.2.5 Complementary assets and dynamic capabilities

David Teece introduced the concept of 'complementary assets'; a very interesting conceptual framework for the link between IC and other forms of assets. Complementary assets are company assets that in an enterprise are added to knowledge resources in the transformation of R&D, new product ideas, and innovations into successful new products in markets. From this analysis, and referring to a taxonomy suggested elsewhere (Bounfour, 2005, see supra), the

results of R&D (knowledge resources, A-1 & B-1) and complementary assets are therefore ‘complementary’. The resulting level of complementarity of these assets, as well as their potential for income generation, is contingent to the type of innovation involved (see Figure 3).

In addition, value creation and competitive advantage are created in the marketplace by building on corporate dynamic capabilities. These can be defined as, “The ability to sense and then to seize new opportunities, and to reconfigure and protect knowledge assets, competences, and complementary assets and technologies to achieve sustainable competitive objectives” (Teece, 2000: 26). In other words, dynamic capabilities are those intangible resources, which allow a company to configure and reconfigure – in a Schumpeterian sense – its knowledge assets (R&D & IPRs) and complementary assets.

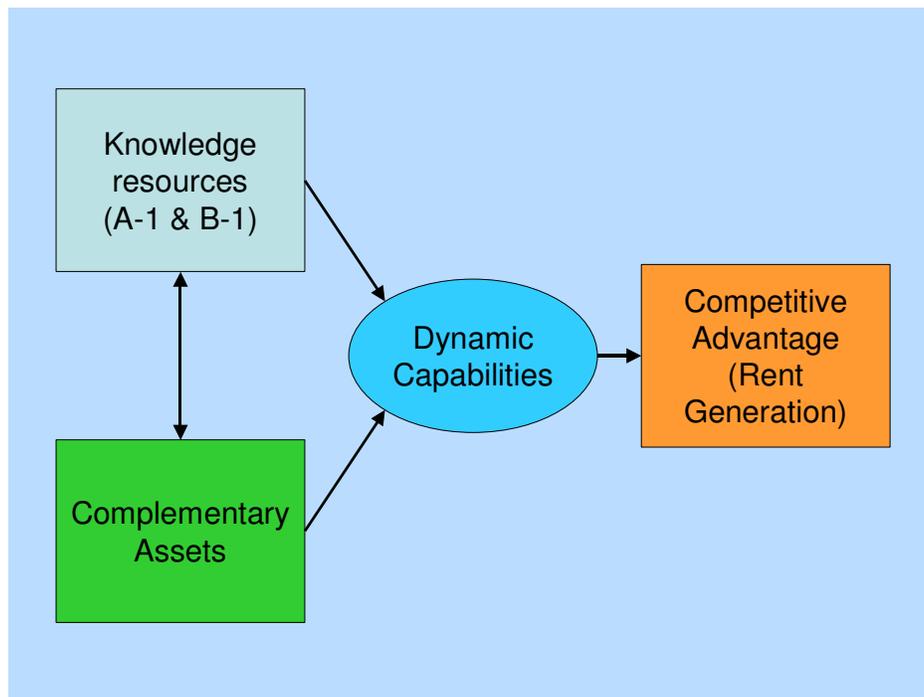


Figure 3: Knowledge Resources, Complementary assets and Value Creation.
Source: Bounfour, A.: Knowledge resources, complementary assets and reporting, forthcoming

2.2.6 Value creation

With this model, we can explore in more detail the dynamic relationships between R&D investment and value creation. In the Knowledge Economy, value is often created in “value constellation” modes (Normann and Ramirez, 1999), rather than in value chains, i.e. in these modes interstices are more relevant than chains. Mastering the “combinatory function” for these intangible resources is therefore critical for companies. These resources are generally located within networks, which poses a problem for SMEs; especially when they have a weak bargaining power because their technology is easy to imitate and replicate and when they do not have the complementary assets that are critical for value creation.

Thus, investments in R&D alone are not sufficient. To succeed an SME needs to master critical complementary assets. These assets matter “because knowledge assets are typically an intermediate good and need to be packaged into products or

services to yield value” (Teece, 2000: 25). Typically, the design of a new car is without value without production, marketing, distribution or even financial assets. Teece distinguishes between three types of complementary assets:

- Generic Assets: General-purpose assets that need not be tailored to the innovation in question (e.g. generalised equipment and skills);
- Specialised assets: Assets with unilateral dependence (e.g. marketing and specialised distribution channels);
- Co-specialised assets: Assets with bilateral dependence (e.g. the repair facilities for the introduction of the rotary engine by Mazda).

Figure 4 provides an overview of possible complementary assets needed to create value from the results of R&D.

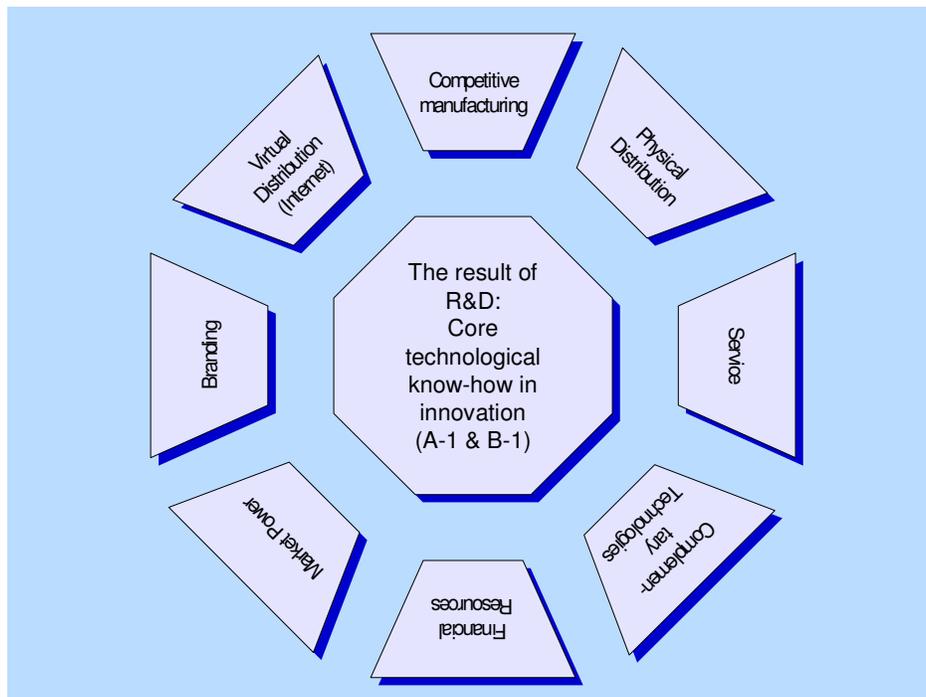


Figure 4: Complementary assets needed to create value from the results of R&D
(Adapted from Teece, 2000)

From this model, we can derive several arguments with respect to the relationship between the results of R&D investment – which are knowledge assets per se –, complementary assets, and value creation:

- Complementary assets, especially co-specialised assets, are of high importance for income generation;
- Those of particular importance are those difficult to replicate, their definition is naturally fully contingent. “Ownership of difficult to replicate complementary assets can represent a second line of defence against imitators and an important source of competitive advantage” (Teece, 2000: 25)
- R&D in itself is not sufficient for income generation; complementary assets are of particular importance, especially when imitators have high bargaining power and when it is difficult to protect the know-how.

Case study 1: Data Processing in the Engineering Department of a Large Airline

Company profile: The company is an important international airline. The internal department for data processing used IC Reporting to benchmark its position against other airlines. For this department, the principal key factors of competitiveness are those relating to the improvement of the quality of the supplied service and to the realisable reduction in cost, due to the methodological developments implemented.

Case study background and objectives: From the point of view of the leaders of the department, it is important to develop internal resources with the intent to deliver "world class" service. To ensure such a quality of service, a hierarchy of criterion was established. Several factors were identified as particularly critical:

- For the resources: the investment in R&D and innovation, the general level of the financial resources available to the firm and the quality of technology and knowledge held by the firm.
- For the processes: the ability to combine intangible resources with the processes and systems dedicated to the creation of new knowledge.
- For output: the quality of the internal services.

The model used for IC Reporting: The IC-dVAI[®] (Intellectual Capital dynamic Value³)

The IC-dVAI[®] is a strategic approach to IC from a dynamic perspective. The approach has been implemented under different contexts, at microeconomic as well as at macroeconomic levels. As far as metrics are concerned, these have to be defined dynamically along four important and interrelated dimensions of competitiveness:

- Resources as inputs to the production process: tangible resources, investment in R&D, acquisition of technology, etc.
- Processes. It is through processes that the deployment of a dynamic strategy founded on intangible factors can really be implemented
- The building of intangible assets (intellectual Capital). These can be built by the combination of intangible resources.
- Outputs. It is on this level that performance of organizations is classically measured, through the analysis of their products and services' market positioning.

The IC d-VAL[®] defines and measures IC in terms of relative indexes as well as in monetary terms. The starting point is a clear definition of the main components for the four dimensions – Resources, Processes, Assets and Outputs. Then a benchmarking process is conducted for these items. Basically we compare the position of a company or a nation to those considered as best performers. The benchmarking exercise leads to calculating ad hoc performance indexes, as well as to a composite index per activity, company, group, country, region or any community.

Main findings: The benchmarking of the competitive positioning of the department compared to those best in class showed that the department is positioned better in terms of output and resources than in terms of processes. The total index of performance was good, even though progress could be made on some items.

Key messages: This case study illustrates the possibility of valuing three aspects of IC: resources, processes and output. This offers several advantages:

- benchmarking corporate performance;
- correction of the market's possible value overestimates;
- the indication of areas of improvement;
- the possibility of developing performance indicators directly connected to operational responsibilities such as: the direction of research for investment in R&D, the direction for product design responsibility, development that optimises the "time-to-market" constraints, or the direction of human resources for the motivation and the development of human capital, whether it is considered on the individual or collective level;
- the presentation of a reasonable indication of the value of the firm.

In the European funded PRISM research project the value creation process was modelled as a 'value mixer' (see figure 5). The four blocks are intended to represent the strategic assets of an enterprise or a nation. They are laid out horizontally to represent the fact that such assets can be accessed from both within and without the

³ The IC-dVAI[®] has been developed by A. Bounfour. (Bounfour, 2000, 2003)

traditional legal boundaries of the enterprise. The value adding generic space is on the borderline where the internal IC meets the external IC.

To the left of the “value creation mixer” lie the tangible and intangibles assets over which ownership rights can - more or less - be elaborated. Tangible goods would include physical assets such as land and buildings, and plant, machinery and equipment. Intangible goods would include packaged and codified assets such as software, brands, trademarks, licenses, and legal intellectual property rights (IPR) of scientific discoveries.

To the right of the “value creation mixer” lie the intangible competences and latent idle capabilities or in other words *capital in waiting*. Intangible competences embrace the organizational capital such as culture, networks and the human capital, which is effectively, leased for productive use from the individual knowledge workers. Latent capabilities are what investors, in particular venture capitalists, are interested in. The discovery and exploitation of this value shaping space is where top leadership truly differentiates itself. In further elaborated terms, it can be viewed as IC-in-waiting and externalized for society innovations.

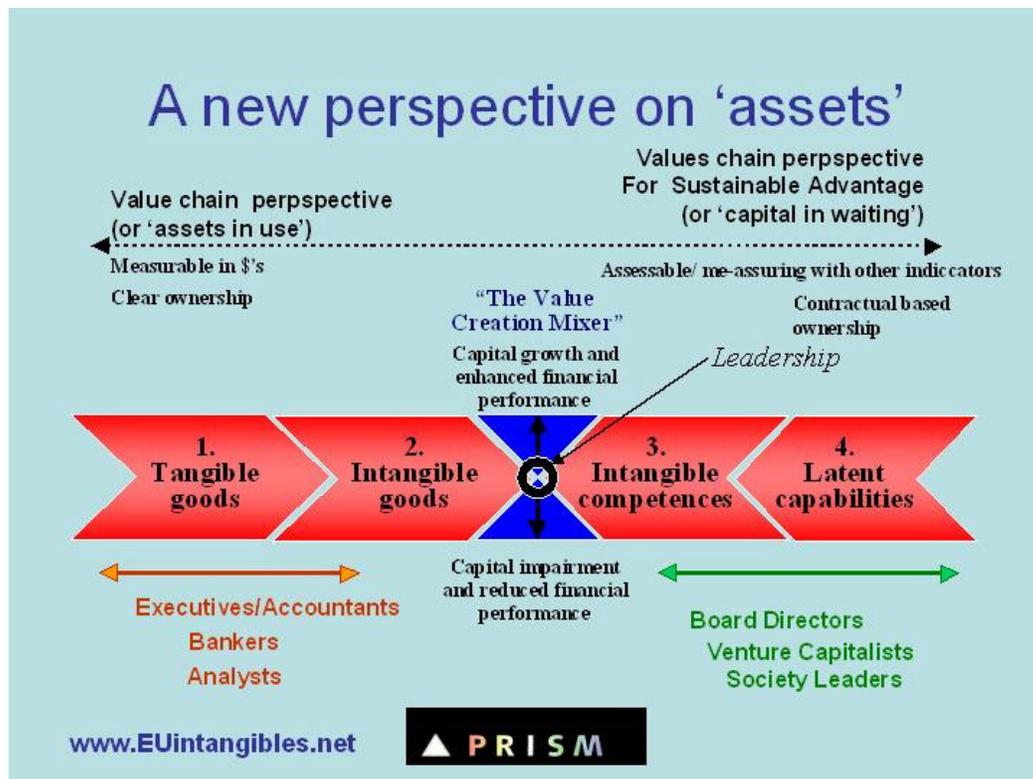


Figure 5: Value areas for IC entrepreneurship

At the core is “value creation space”. It is where IC leadership faces the challenge of leveraging these longitudinal resources and create economic value adding. This is the space for knowledge entrepreneurship. It might lead to growth of capital on the balance sheet as well as impairment of the balance sheet. A critical question will emerge: What is the knowledge leadership of today doing to avoid erosion and instead leverage the idle IC in waiting and how do we know about this from improved IC Reporting?

PRISM tried to delineate the intangibles into separate parts. The enterprise value is increasingly contingent on the effective organization of its networked processes. What makes the difference is the interactive organization of the intangibles related to human, relational and organizational capital⁴.

2.2.7 Complementary assets and reporting

In regard to the issue of intellectual capital reporting, which will be discussed in paragraph 2.5, we can now conclude that:

- Reporting of R&D and innovation resources is not sufficient, especially in a situation where the knowledge involved is difficult to protect and easy to replicate;
- Reporting on complementary assets can be of high importance, especially for those hard to replicate. These resources might be internal or external;
- The links between R&D/innovation resources (knowledge assets) and complementary resources are ensured via dynamic capabilities. Some of these are indeed internal complementary resources (organisational resources). Reporting on these might be of high importance, especially in a situation where the knowledge involved is difficult to protect and easy to replicate;
- Reporting on complementary resources of high importance might facilitate the availability of financial and human resources for R&D and innovation and might lead to a better transparency of the needed complementary resources.

2.3 Barriers to R&D investment

2.3.1 Barriers

There is much academic, public and political discussion about what the most critical barriers for investing in R&D and innovations by SMEs are. In general, the innovation and investment barriers can be grouped into four areas:

- i) financial resources,
- ii) knowledge,
- iii) human capital, and
- iv) management competences (European Commission, 2003a).

These areas are equally important and lack of capital is not necessarily the most pressing obstacle for investing in R&D. In general, the problems and barriers are dependent on the size, stage of development, age, sector, type, and location of the SME. Hence, measures to address these barriers have to be developed in a differentiated way.

In addition, the perceived economic, technical and market-related risks hamper investment in R&D and innovation in SMEs (European Commission, 2004). This leads to the common argument that the costs of innovation are too high. In general, R&D activities in SMEs are mostly applied with a short-term horizon and are often carried out in an informal way and R&D activities are thus related to the acquisition, adaptation and improvement of existing technologies. Moreover, since research projects are sometimes non-separable and demand certain critical levels of scale,

⁴ For further reading see www.euintangibles.net

SMEs find it difficult to start R&D projects. In addition, SMEs usually carry out only a few and often only one project at a time and thus they are not able, as large companies are, to spread the risk over a portfolio of projects.

The quick transformation of ideas, research results or new technologies into improved or new products is typical for SMEs. Information about new technological opportunities and information about market development are therefore important, but not always available. Better information about technological and market development leads in general also to different perception of the risks.

2.3.2 Financial resources

There are many reasons why SMEs find it difficult to raise finance from banks and equity from investors, but fundamentally, the decision rests on “The ability to construct and explain a credible business proposition”.

Investment in R&D and innovation is risky and it is often very difficult to predict how successful the end result will be. Whilst large enterprises, with established brands and channels to market, can spread their risk through diversification of their research and innovation activities, this option tends not to be available to SMEs who may stand or fall based on the success or failure of a single product or service. Large enterprises with a portfolio of products and services that delivers an existing cash flow find it relatively easy to fund innovation – not based on the research project itself but rather against the strength of their existing cash flows. SMEs without established income streams find it very difficult to raise external finance.

With respect to financing R&D and Innovation specific types of SMEs have specific types of financial need and what may be available to meet these needs may depend more on the financing system with individual countries than on characteristics of the firm such as size, sector, age and profitability (European Commission - 2000). In some countries SMEs rely more on debt financing than others. In some European countries, such as Austria and Denmark, there is a strong culture of debt financing through Banks who impose natural constraints when financing innovation, due to factors such as perceived high risk and the absence of collateral (European Commission, 2002).

In general, financing problems are more pressing in the start-up and early development stages and this is particularly the case in high-tech sectors such as biotechnology.

- Equity (Angel investors, Venture capital, & Corporate venturing) are often regarded as the solution to the problem, but each of these sources tend to target different points in the Innovation Value Chain:
- Angel investors – Proof of concept, early stage technical development & product development
- Venture Capital – Some early stage technical development, but the usual emphasis is on the growth and expansion phase of SME development via investment in product development and gearing up production and marketing capabilities
- Corporate Venturing – Some product development but an emphasis on gearing up production and taking products to market

Whatever the type of funding (whether debt or equity) information asymmetries tend to hamper the acquisition of financial resources by SMEs. The quality of information provided by SME's or requested by Banks remains poor in that it frequently fails to articulate the resources and capabilities which drive value creation. The information which is provided tends to dwell more on financial accounts rather than on strategy, innovation projects, management methods etc. More comprehensive information

about IC in general, and R&D and innovation in particular, will help SMEs to overcome this financial gap.

2.3.3 Knowledge

Acquisition and combination of external and internal knowledge is necessary to successfully introduce innovations in markets. Innovation takes place in an increasingly complex environment. Innovators today need a broader knowledge base than in the past. External and internal knowledge sources are therefore highly important and have to be managed, which requires a specific amount of absorptive capacity. Thus, SMEs have to invest in and combine, different forms of intangible resources. Key sources of external knowledge include:

- Research & Technology Organizations;
- Universities;
- Suppliers;
- Competitors;
- Customers;
- Trade Associations;
- Government Agencies.

In this context the question of the protection of the competence base in general and research and innovation in particular, should be mentioned. From the firms' perspective, it is central to protect the knowledge and competence base (ideas, technologies, etc.) from imitation by competitors. In general, high amounts of tacit knowledge, secrecy or using Intellectual Property Rights such as patents and confidence agreements with customers, are options to protect the intangible competitive base of SMEs. In addition, 'first mover' advantages when entering first into the market or binding customers by offering complementary services, are important issues to be taken into account. However, strategic decisions with respect to the protection of IC are not always taken. Explicitly deciding about these options requires competencies that are often not existent in SMEs. A better understanding of these mechanisms might provide additional incentives for investing more in research and innovation.

Up until now, the knowledge sources of Universities and Research and Technology Organisations (RTOs) are used by only a small group of SMEs. According to innovation surveys, only about 10% of the innovative SMEs co-operate with this kind of organisation; although the potential to use technical knowledge developed within universities and research organisations is large. The lack of experience, the lack of management competence and the lack of information about potential partners and topics, are some of the reasons why SMEs are reluctant to interact more closely with Universities and RTOs. More intense use of IC Reporting by Universities and RTOs could make a positive contribution to the adoption of IC Reporting within SMEs, as these organisations could serve as an example. Hence, SMEs could not only learn about research and innovation management, which is often the case, especially in co-operation with RTOs, but also about IC management and reporting.

Moreover, it is increasingly important not only to co-operate with a few partners but also to be linked into networks, e.g. into research networks or supplier networks. Management issues, strategic considerations and the problems of protecting their own competence base, are important barriers to SMEs being engaged more often in networks.

2.3.4 *Human Capital*

Labour shortage and skill gaps are important factors in hampering innovation and R&D driven business activities and economic growth. Surveys show that especially technology-based SMEs have problems in recruiting qualified personal; in many cases, skilled technicians are searched for (European Commission, 2002). In addition, the internal development of employees is highly important. Michie and Sheehan (1999) show that skill-shortage is a serious obstacle for innovations and in moving towards more complex and higher-priced products. Thus, it is obvious that attracting, developing and managing Human Capital is highly important for successful innovative firms.

Not only the R&D and innovation performed by SMEs is informal but also their competence development and employee training is informal. In SMEs 'learning by doing', 'learning from others' and 'learning-on-the-job' are important forms of learning and are more important than formal training activities. This type of training practices result in tacit competencies and skills, which contribute to the competence base of SMEs and are difficult to imitate by competitors. However, at the same time they are more difficult to measure by standard indicators such as diplomas etc. At the moment formal training of individuals is becoming more important for SMEs. However, only about half of SMEs have an explicit strategy or a written plan for developing their competence-base (European Commission, 2003). Lack of financial resources, lack of time due to short-term business pressure, lack of motivation and lack of planning, are all-important reasons why SMEs do not carry out formal training (The Institute of Market Trends) (2002). Moreover, SMEs are not always able to analyse and identify their own competence needs effectively. This is another area where IC management and reporting can contribute to increasing the competitiveness of SMEs.

Furthermore, for people to be productive they need to have a sense of:

- Shared Goals – Plans pull people together by providing a shared sense of direction and purpose. They enable people to see how their efforts can and do contribute to current and future success.
- Shared Culture – Culture needs to be aligned to support the enterprises competitive strategies, people need to feel respected, but they also need to feel confident about the future and motivated to sustain an attitude of building value for everyone associated with the business.
- Shared Learning – As the business environment evolves, new problems and opportunities emerge and people need to develop their abilities in order to remain responsive to innovation and change. Learning What, Where, When, Why and How to achieve a constant stream of improvement within the business, is a key element in the success of any enterprise.
- Shared Effort – People tend to work better when they feel part of a group and teams achieve more than a collection of individuals. Whilst different departments may have different ways of working, it remains essential that they work together with a spirit of co-operation and common sense of purpose.
- Shared Information – Information is needed to set sensible objectives and to establish priorities. Managers need to know what is going on so that the enterprise can identify problems and opportunities quickly and respond appropriately. People need to know what is critical to success and information flows, metrics and key performance indicators (KPI's) need to be designed to both track performance and influence the right behaviours.

2.3.5 *Management competencies*

Finally, the lack of management competences in the fields of innovation, marketing and organisation is another reason why SMEs do not invest more in R&D and innovation. In this regard, the assessment of market development, especially important for launching new products, is a specific problem. Here again, the lack of competencies on how to plan and implement R&D and innovation projects is a barrier for a stronger engagement of SMEs in R&D and innovation. What is needed is a balanced team that possesses key competencies including, for example:

- Knowledge Specialists;
- Project Management;
- Product Development;
- IP Management;
- IT Management;
- Production and Distribution;
- Compliance with Regulation and Standards;
- Human Resource Planning;
- Staff Development and Training;
- Sales and Marketing;
- Finance and Performance Management;
- Strategy and Planning;
- Risk management;
- Buying & Contract Management;
- Internal and External Communication.

Many of these disciplines may be combined within a small enterprise and which strengths are needed will depend on the portfolio of activities being undertaken or being considered. Effectiveness in these areas provides a range of complementary assets. The presence (or lack) of these important skills, competencies and capabilities are key drivers of innovation and important enablers when the enterprise seeks external finance.

2.4 Finance and investment for IC

Investing in Innovation is risky. The market for products, services and processes changes over time and whilst some trends may be evident, based on knowledge of the market and competitor activity, many changes are simply unknown or unknowable; so risks and uncertainties associated with investing in R&D and Innovation are many and varied. There are many types of risk associated with R&D and Innovation, for example:

1. Does the technology work?
2. Has the enterprise a competitive advantage and what will profit margins be?
3. Is the product, service or process scalable?
4. Can quality be controlled and maintained?
5. Is there a market need and how big is it?
6. Can the market be accessed?
7. How big is the market opportunity and how long will it last?
8. Does the product, process or service comply with industry standards?
9. How is the business and legislative environment changing?

10. Is this business in danger of running out of cash?

Getting credible answers to these types of question is vital and whatever the aims and purpose of the business, it tends to be the clarification of the non-financial (intangible) factors rather than clarification of financial (tangible) factors which lead to decisions to invest.

To attract finance for R&D and innovation, the key challenge is to articulate the sort of value proposition and risk profile that would appeal to lenders (Debt providers) and investors (Equity providers).

An IC Statement, if properly used, can help SME's to explain why finance is needed, how it will be used and to provide a basis for assessing the degree of risk and the certainty surrounding the finance proposal, hence the way in which the finance proposal is best suited to debt, equity or a mixture of the two.

An IC statement helps overcome the differences in knowledge between entrepreneurs and financiers (information asymmetries) by providing key points and associated narratives which demonstrate that the SME:

- Understands its technologies and areas of expertise – its skills, competencies and capabilities;
- Understands its areas of competitive advantage, its intellectual property (IP) and technical standards related to its products, processes and markets
- Understands its customer's needs, wants and aspirations and the value that its products and services are able to deliver to them;
- Understands its markets and how to access them
- Has a credible strategy for getting its products and services to market, profitably, despite the competitions;
- Has a credible strategy for managing everything needed to manage the overall sequence of activities needed to succeed (e.g. value chain positioning and management of operations);
- Is able to substantiate assumptions used in the preparation of financial projections and is able to provide a flow of information to lenders and investors to keep them informed of the way in which the business is progressing.

Ultimately all forms of external finance should be viewed as providing the cash required to bridge the gap between the need for money now and the generation of money in the future. It should also be borne in mind that ultimately a business fails (not initially because of losses) because of its inability to pay bills as they fall due.

For lenders (Debt propositions) an IC statement helps to show that the loan is relatively risk free, because of the way the money is to be used and the way in which cash will be generated. This focus on cash flow helps to demonstrate to the bank the ability to cover interest as it falls due and to repay loans in accordance with agreed repayment schedules.

For investors (Equity propositions) an IC statement helps to show the size of the business opportunity and the most sensible way to invest to maximize the potential return on the investment. The focus is still on future cash flows but the return is based on maximizing the market value of the business – hence the market value of the investment.

There are various sources of finance for investments in R&D and innovation:

2.4.1 Bank Lending

By its very nature, bank lending is only suitable to propositions, which carry very low risk. This is because the bank only has its lending margin, over and above the cost of funds (costs associated with attracting deposits - interest payments etc. – in other words its net interest income), to cover the costs of appraising and monitoring loans, covering losses arising from bad debts and providing an acceptable return to shareholders. To put this in perspective lending at 4% above its cost of funds would mean zero profit if one in twenty five borrowers failed to repay. In other words the bank needs to get its lending decisions right more than 96% of the time to make any money from lending.

Notwithstanding the level of risk that banks are willing to accept with regard to lending, the majority of research-intensive SMEs see banks as their primary source of funds. (It should also be noted that some banks also provide equity, sometimes packaged with lending, sometimes as a distinctive business area).

Other important sources of funding for research-intensive SMEs being:

- Personal funds including money from friends and family;
- Lending substitutes e.g. Leasing, Invoice Discounting and Factoring;
- Trade credit – being given time to pay by suppliers.

As perceived risk increases, so it becomes more difficult to obtain bank finance. Whilst banks do vary the interest rate they charge, the variation in rate is more usually associated with assessing, processing and monitoring lending than in assessing things like technological and operational, and market risks. IC statements can help by providing explanations which can help to give lenders a more accurate perspective on these risks.

Interest rates

Low Interest rates typically associated with	High Interest rates typically associated with
Strong balance sheets	Weak balance sheets
Profitable enterprises	Loss-making enterprise
Large Loans	Small Loans
Ability to provide collateral	Inability to supply collateral
Low perceived business risks	High perceived business risks

In theory banks could act more like insurance companies (High risk = High Premium) and charge very high interest rates for very high risk but:

1. Charging high interest rates may be seen by the Banks as damaging in image terms, Banks are already under pressure to support business with low interest rates and a major problem would seem to be that debates tend to focus on the cost of finance rather than the value (to the research-intensive SME) of the finance provided. IC statements focus on the drivers of future success which may be helpful in building demand for high interest rate lending.
2. Banks don't have an effective mechanism for assessing individual business risks. (As opposed the way in which insurance companies look at the statistical chance of, for example, a car accident, burglary, fire, hurricane occurring over a specified time frame etc.) IC statements could help by removing the degree of uncertainty through better quality dialogue covering a more detailed explanation of what is being invested in by the research-intensive SME based on which logic etc.

Building on this, one possibility might be to encourage banks to develop high interest rate (or mezzanine – high interest or debt with an option to take equity etc.) products specifically aimed at R&D intensive organisations which produce IC statements, possibly through involvement of the EIB / EIF or through member states directly via loan guarantee schemes or equivalent means.

2.4.2 Venture Capital

Venture capital is very different from bank lending because the gain ('reward') comes, not from profitable lending based on net interest income, but from a share of future profits. Because of this there is a much greater degree of alignment between the interests of the venture capitalist and the interests of the entrepreneur.

Venture capitalists achieve differentiation from one another through capabilities such as their ability to understand technologies, to assess the market opportunity and to build the team within the research-intensive SME, or through collaboration with others, to get products to market successfully – (IC statements can assist in all these areas of the business proposition). Investment does come at a price however in that the entrepreneur loses a degree of control and has to share the value of the business.

Whilst venture capitalists provide equity, they do not typically take a long-term view; investments are typically made to achieve certain results which enable an exit and hence realisation of their investment – usually either in the form of a trade sale or stock market flotation. It should also be borne in mind that only around a third of venture capital investment goes into high-tech sectors (EVCA, 2002). Of this, the majority tends to go on market development, rather than research. The amount of investments by venture capital, measured as percentage of the GDP, differs widely within Europe. While in Sweden and the UK this is more than 0.6%, in Austria, Greece and Portugal it is less than 0.1% of GDP.

2.4.3 Corporate Venturing

There are a number of typically large enterprises, which will take an equity stake in an research-intensive SME that is developing knowledge or know-how in an area considered to be of strategic importance – usually within the investor's core markets.

For the investor, corporate venturing can offer additional options and flexibility by providing:

- Access to scientific and technological developments (S&TD);
- A cost effective addition to existing R&D programmes;
- The ability to ring fence specific projects within a distinct legal entity.

For the investee (the research-intensive SME) corporate venturing may offer:

- Access to vital complementary assets available from the large enterprise,
- access to markets, superior branding & reputation, management capabilities etc;
- Lower financial risk and better prospects of producing something tangible in a shorter timescale, hence better value realisation prospects and exit options;
- The ability to motivate and retain key individuals and teams through shareholdings.

In essence, corporate venturing seeks to create value by combining the complementary assets of a large enterprise with the strengths of an entrepreneurial small company (creativity, flexibility, responsiveness etc).

As corporate venturing investments tend to be strategic in nature, they are often tied into contractual agreements such as:

- Licensing and distribution agreements over products arising from R&D;
- Agreements relating to the sharing of technology between the two enterprises;
- The extent to which the large company will provide resources and capabilities to the research-intensive SME, e.g. managerial, legal, technological, operational & marketing support.

2.4.4 Informal Venture Capital - Business Angels

Business Angels, tend to:

- Be self-made high net worth individuals who invest directly in unquoted businesses in which they have no family connection;
- Invest in early stage businesses rather than in seed or start up businesses;
- Invest in types of business where they have existing experience or where they have specific skills (complementary assets) which will help achieve success;
- Invest in businesses which are within easy travelling distance;
- Either invest alone or invest as part of a group (Syndicate);
- Find investments through networking activities.

Initial assessment tends to be rapid (typically minutes) based on:

- The perception of the market opportunity;
- The quality of the management team;
- Financial considerations;
- Technology & IPR;
- The actual products and services being offered;
- The way the business is run (operations & business model);
- Perceived role within the business in building value;
- Timeframe and exit options.

Once the research-intensive SME has passed the initial assessment, the business angel will invest a great deal more time to undertake whatever due diligence he or she may feel is required before making an investment. There is evidence that business angels with specific technological experience and expertise, tend to invest in ventures from the same sector (Reichhardt, A 2005). Many investors, but not all, will want to take an active role within the business in order to monitor their investment and to ensure that the business is properly developed and groomed. One of the reasons for this is their desire to achieve an exit for their investment. As is the case with Venture Capital firms, this tends to be either a trade sale or market floatation, but in addition their exit may be geared to a further round of investing at a higher level by a Venture Capital Firm.

2.4.5 Stock Markets

Healthy stock markets are of vital importance to research-intensive SMEs seeking equity investment. The appetite for technology stocks, or lack of it, directly influences the activities of venture capitalists and business angels. When the appetite for technology stocks is high, exit prices are high so incentives to invest are high and when the appetite is low, prices are also low. Changes in tax law (e.g. Levels of

Corporation tax, Company employment costs, Deductibility of interest on loans, Policies on taxing dividend income within pension funds, Environmental taxes etc.) all have an effect on stock market performance. If money floods into equity markets then money is released to fund more risky ventures, but when markets see difficulties ahead, then funding for innovative ventures also dries up.

2.5 The contribution of improved IC Reporting

2.5.1 Key issues

Intellectual Capital Reporting is the process of creating a story that shows how an enterprise uses its IC to create value for its customers. This involves identifying, measuring, and reporting IC, as well as constructing a coherent presentation of how the enterprise uses its knowledge resources. Often this process leads to the writing of an *Intellectual Capital Statement*, which is a report on the enterprise's IC that combines numbers with narratives and visualizations. This can fulfil two functions:

- complement financial management information (internal management function);
- complement the financial statement (external reporting function).

As we have seen in paragraph 2.2, most research-intensive SMEs create value in 'value constellations' that draw complementary assets from various sources; e.g. a network. Some of the complementary assets that are needed to create value from R&D will be available within the enterprise, but most will come from other enterprises in the network, so they are not owned by the SME. This is one of the reasons why research-intensive SMEs need to master the combinatory function to be able to combine the complementary assets needed to create value.

Paragraph 2.5 showed that access to four types of complementary assets is especially problematic for research-intensive SMEs:

- Attract Financial Capital
- Attract Knowledge and other external complementary assets
- Attract Human Capital
- Develop Management Competencies

It is here that IC Reporting can contribute to improving the creation of value by research-intensive SMEs. The benefits of IC Reporting for research-intensive SMEs fall into two categories: The first category is its potential to function as an internal navigation tool to help develop and allocate resources – create strategy, prioritise challenges to the SMEs development, monitor the development of the SMEs results and thus facilitate decision-making. Within research-intensive SMEs the need to navigate intellectual resources is bigger and at the same time more difficult. From this function follows a second category of benefit, which is the potential of IC Reporting to function as a communication device to the SMEs environment that can be used to attract resources – financial resources, human resources, relationships with partners and customers, and technological resources. This benefit is of extreme importance for research-intensive SMEs because for them it is much more difficult and complex to attract resources.

2.5.2 To navigate the firm

IC statements are a part of a companies' knowledge management strategy. If a company has not specifically managed its knowledge resources, then working with IC statements can develop this resource. If knowledge resources are already being managed in one form or another, working with IC statements can help systemise

knowledge management, add other relevant initiatives and through this develop a proper strategy for knowledge management. Companies with experience in preparing IC statements have seen their primary management role as gaining control of company strategy by knowledge management. They have been looking for a coherent update of their knowledge and a systematic approach to managing and to sharing knowledge, which supports their company's general strategy. See Figure 6.

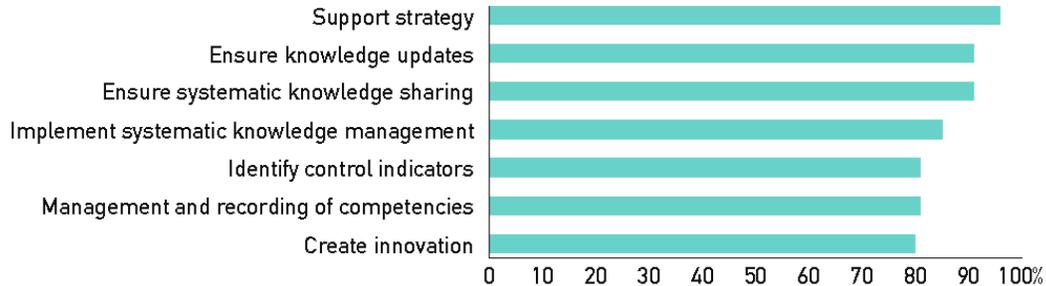


Figure 6: Proportion of companies with the following internal IC statement objectives.
Source: Questionnaire survey of Danish companies that have worked with IC statements

The benefits of preparing internal IC statements to the management of the firm are as follows:

- The IC statement helps *develop the firm's strategy* and focuses on its innovative capabilities, including the development and use of knowledge and intangibles. It helps to develop the firm's strategies to:
 - (a) develop customer relations by focusing on how the firm makes a difference to users and customers;
 - (b) develop innovation that is guided by the firm's internal knowledge and capabilities as well as its knowledge about users and customers;
 - (c) develop effective processes by delving into new process objectives;
 - (d) develop the business model that, in turn, helps the firm to develop its intangible resources for productive use.
- The IC statement is a *monitoring system* that helps firms to account for their intangibles resources and relate them to innovation. Therefore it can be said to:
 - (a) survey the composition of intangibles and explain the developments in the composition of resources;
 - (b) also survey the investments made in developing intangible resources and thus makes the firm's efforts to make greater use of intangible resources visible;
 - (c) monitor the effects of intangible resources and throw light on the results gained from intellectual resources. The case study of CTC shows that this even works with company culture as an intangible resource. As such, the IC statement is an accounting system for firms that wish to manage their intangibles in a similar way to how they manage their tangible resources.

The IC statement benefits the firm's innovative ambition by linking efforts and objectives to make the firm a more innovative one. The development of a useful IC statement requires that the firm (a) describes and assesses the firm's intangibles and (b) monitors, evaluates and develops them according to the purposes they are supposed to fulfil. This sounds easy, but does require effort. The German and Danish Guidelines on IC propose two complementary ways to do this (see paragraph 3.2).

Case study 2: Celle Technology Center (CTC) of [Baker Hughes INTEQ](http://www.bakerhughes.com)

<http://www.bakerhughes.com>

Company profile: Baker Hughes INTEQ is a leader in oilfield services that creates value for oil and gas producers by providing practical technology to find, develop, produce and manage petroleum reservoirs. The following case study focuses on their technology centre, based in Celle, Germany.

Case study background and objectives: A company culture and its core values are essential for sustained competitiveness and for future earnings capabilities. The purpose of creating the IC statement was to answer the question of, 'what management actions could be taken today, in order to secure a continuous positive evolution of the successful company culture and therefore to secure the future of the company'. Moreover, the aim was to find out where future value creation for the company takes place. In this sense, the IC information was meant to be used for internal management purposes only.

The model used for IC Reporting: In order to find out if the company culture was fit for the future and what management could improve in order to raise its IC, it was decided to make an IC-RatingTM conducted by Wissenskapital⁶. The motivation for using this model is to visualise the culture and to analyse the key areas of Structural and Human Capital in this company. At the same time it can show management and investors the importance of a high IC rating in order to stay competitive in the future. The rating of the Human and Structural Capital of this company is based on 15 internal interviews.

IC-RatingTM is based on three focus areas:

- Efficiency - Present value of IC efficiency in creating future value;
- Risk - Threat against present efficiency; probability of threat coming true;
- Renewal and Development - Efforts to renew and develop present efficiency.

The IC-RatingTM looks at the three pillars of IC: Human Capital, Structural Capital and Relational Capital.

The method used for information gathering: The rating of the Human and Structural Capital of this company was based on 15 internal interviews. The interviewees were selected from different departments and age groups and reflected variety in years of service, organisational level and gender.

Main findings: The overall result of the IC-RatingTM for Baker Hughes was close to best in class. Moreover, Baker Hughes gets the second highest grade (out of ten) in operational efficiency and a very high grade on company structure. The risk factor is modest to low. The business environment has forced CTC to become more innovative and flexible, which clearly shows in the results of the IC-RatingTM.

Moreover the exercise produced a number of recommendations:-

- The company must learn to capitalize more on structural capital resources internally as well as externally.
- Start to apply IC-RatingTM in all departments of Baker Hughes and carry out internal benchmarking.
- Keep CTC learning and innovative by launching an arena for structural capital and future intelligence development, preferably in cooperation with other firms in the region.
- Keep intensifying the networking between employees within Baker Hughes Europe and with the headquarters in Houston to ensure a global flow of knowledge sharing.

Key message: IC Reporting can make the important role of the company culture and values visible, measurable and manageable.

2.5.3 To attract resources

IC statements can communicate with relevant external stakeholders in order to inform, and persuade them, about the specific character of the firm, so that they can take decisions about interacting with it in new ways. The IC statement informs about the firm's resources, capabilities and other intangibles that have an impact on the future of the firm; just as the financial statement informs about the state of the firm's financial resources. Future prospects are enhanced by the communication because

⁵ More information on IC-RatingTM is available at: www.intellectualcapital.se

⁶ Wissenskapital Edvinsson & Kivikas Entwicklungsunternehmen GmbH (Wissenskapital). More information is available at: <http://www.wissenskapital.info>

its purpose is to show, and persuade, relevant partners that there are good reasons for them to increase their engagement with the firm. The effect of an intellectual capital statement on investors can be illustrated with the case of Coloplast.

Case study 3: Coloplast A/S

www.coloplast.com

Coloplast has made a conscious decision to develop the published IC statement with a stakeholder approach and thus focus on communication with customers, employees, shareholders and society more generally. The external version of the IC statement is included in the Annual Report. Internally, the IC statement is a more specific one and for many indicators in the IC statement, Coloplast develops management agendas and Key Performance Indicators for managerial purposes.

PriceWaterhouseCoopers⁷ tested Coloplast's 2001 Annual Report to see whether it makes a difference to include IC type information or not. UK-based Schroder Asset Management agreed to take part in an experiment where 25 fund managers were divided into two groups. The first group was presented with an "no names" edition of Coloplast's 2001 Annual Report (the "Full Report"). The second received a version of this report that excluded all of the quantified non-financial information that the company had elected to report. This modified document resembled a more traditional annual report – with financial information, notes and some accompanying narrative but little quantified contextual data. We refer to this as the "Financial information" set.

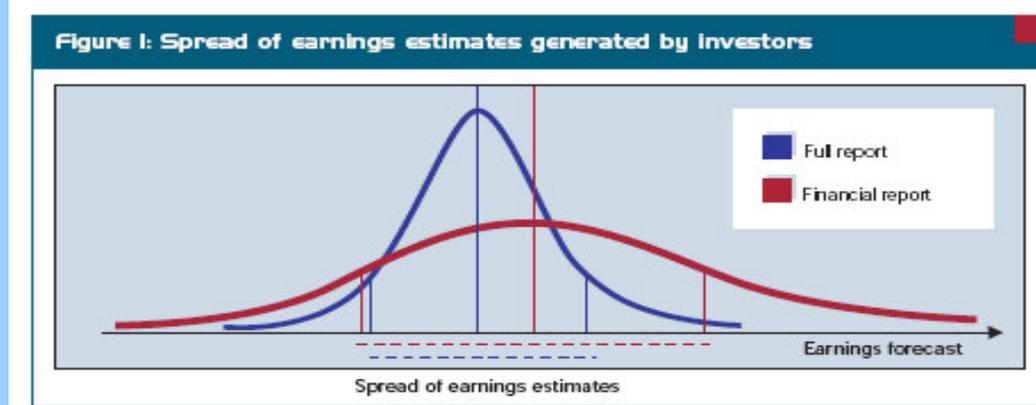
The investors were asked (1) to generate forecasts for revenues and earnings for Coloplast, and (2) to provide their recommendation on the stock. The findings offered an interesting insight into the economic benefits of transparency.

The revenue and earnings forecasts generated by the investors both showed a similar pattern. Those with the complete information set – the "full" report – generated lower forecasts than those with the "financial information" set.

However, when the recommendations on the stock were analysed, a surprising picture emerged. Over 60% of the investors with the original report said that they would buy the stock today. This stood in stark contrast to those with the "financial information". Despite having higher revenue and earnings estimates, 80% of the investors in this group said that they would sell the stock.

To understand this result, it is instructive to consider the spread of the earnings estimates around the averages generated by the two groups.

From Figure 1, it can be seen that the range of estimates from those with the complete information set was notably less than that generated by those with the "financial information". In short, it appears that the quantified contextual information volunteered by management in the original document lessened the informational asymmetry between owner and manager, allowing the investor to "forecast with confidence".



On a more anecdotal note, Coloplast says that fund managers and analysts are reluctant to take IC type information seriously, but nevertheless in meetings with fund managers and analysts Coloplast experiences that with the IC type information they start to ask new questions and they often demand information that is already made available by IC type information.

⁷ Thomas, A. (2003/4) A Tale of Two Reports, *European Business Forum*, Issue 16, Winter

IC statements can be used to communicate to various stakeholder groups:

- To the *company* it communicates identity, who 'we' are and what the development strategy is. The benefit is that existing employees can understand the firm's situation and thus engage more fully in developing the firm's condition. If employees know the direction of the firm, they can also help develop the specific objectives to follow and, not least, they can understand how the knowledge they may have, but are not presently using, could be applied more effectively. As innovation is about novelty, which cannot always be expressed as clear objectives and targets, IC statements help create a system of 'ambitions' that the employee can help to make more concrete.
- To *potential employees* it gives an impression of what it is like to be an employee, including how their resources will be used and developed. This is valuable because then prospective employees can approach the firm with a clear idea of how they can contribute to the development of the firm. This makes the attraction of relevant categories of employees easier, particularly in innovative situations where it may not always be able to specify all relevant objectives and principles in advance.
- To *customers* it sends a signal of what it is like to be a customer, including into the future. The customer can learn about the firm's 'staying power' and thus make a judgment as to whether or not this firm will be a partner that can help it to develop, even over the long term. In innovative relations this is particularly relevant; because innovative ambitions develop all the time and cannot be defined once and for all.
- To *co-operative partners* in the value constellation it illustrates what it is like to co-operate with the company. Partners can be providers of knowledge, such as Research & Technology Organizations, assembly and manufacturing partners, sales, marketing and distribution partners, or other partners providing complementary assets. Through the IC statement, the partner can learn about the 'staying power' of the firm and its willingness, and ability, to be innovative.
- To *investors* it documents the company's ability to survive future competition. The investor can acquire improved understanding of the enterprise's business model and may be able to judge the level of risk and uncertainty. This may have a consequence for the cost of capital.
- To *citizens* it explains what is being done to secure the best possible services, for example for users of public services. This general environment is interested in learning about the efforts made to develop relevant services and products. In an innovative environment this is relevant, because products and services have a tendency to have shorter and shorter life-cycles.
- To the *political system* it gives insight into how the companies are run, allowing politicians to improve their estimation of its competencies and quality. In turn, this enables the political systems to improve their allocation of funds in the development and implementation of innovation policies in the EU, or a particular region.

Companies therefore become more visible and probably more interesting to these target groups. In other words, external IC statements can make it easier to communicate a company's interests and therefore attract new employees, customers or even investors. Most companies that have already published IC statements have reported that one of the statement's objectives is to communicate the company's 'invisible assets' and also attract more employees and customers. These companies

often want to show that they are innovative and flexible, and that knowledge and human resources are important assets. See Figure 7.



Figure 7: Proportion of companies with the following IC statement objectives. Source: Questionnaire survey among Danish companies that have worked with IC statements

2.5.4 Attracting Financial Capital

The nature of investing in scientific and technical research and development means that both the quantity of investment and the timing of sales can be difficult to predict. Alongside these technical and market uncertainties lies the issue of timing, in that payback tends to be both greater and faster, if products get to the market sooner rather than later. Since running out of cash means failure for a research intensive SME the ability to attract external sources of finance is of particular interest.

Information asymmetry provides a barrier between those with the technical knowledge and potential investors which needs to be overcome in order to ensure that investment opportunities which should be funded actually do get funded. Overcoming this asymmetry requires an investment in time and effort both on the part of the SME and the financier and the role of an IC statement is to help improve the quality of dialogue between the two parties thereby keeping these costs to a minimum and in speeding up the decision making process.

The Basel II regulations help to ensure that Banks provide sufficient capital to cover risk within their lending portfolios so that the bank's depositor's money is not exposed to undue risk. The impact of this is that banks who are inexperienced lenders or who take on more risky advances are forced to allocate more capital to lending to research intensive SME's and this may have a detrimental effect of the provision of some funding.

IC statements can help both SME's and Banks to overcome this potential problem by improving the process through which the two parties communicate. IC statements help to ensure that risks are assessed more rationally so that those lending propositions which deserve funding get approved and those which are better suited to equity investment because of the level of risk involved do not get approved. This does however mean that in Member States where equity markets are less well developed SME's may be disadvantaged. As a general point information flows between SME's and Banks still need to improve significantly in order to ensure efficient "access to finance".

According to the ENSR Enterprise Survey 2002 (European Commission, 2003) banks only receive a balance sheet and profit and loss statement from about two thirds of their SME customers. More advanced documents are seldom delivered by SMEs. Financial plans and cash flow forecasts are provided by about 18% of SMEs, other qualitative information is provided by about 8%. Anyway, about 20% of all SMEs do not provide any written information at all.

To see whether this conclusion is also valid for research-intensive SMEs we asked EIM Business & Policy Research to have another look at the data⁸. The ENSR Enterprise survey 2002 does not distinguish between research-intensive and not-research-intensive SMEs but does provide a few data on innovation activities, which could serve as proxy for innovation and R&D intensity by the firms. The survey asks if companies had been in contact in the last three years with Technology transfer bodies, science parks, universities or research laboratories. One could assume that firms who are in contact with such institutions are also pursuing more actively innovations strategies. The data show that on average firms who are in contact with this institutions deliver more frequently information on the budget for next year, financial plans and cash flow forecasts and other, qualitative information. For example 10% of the companies who had been in contact with universities provide other qualitative information to banks but only 5% of the companies who had no contact. The same hold for relationships with technology transfer bodies. At the same time these firms are seldom amongst the group of companies who do not provide any information at all. This information thus delivers empirical evidence that innovative companies indeed provide more and better information to banks.

In general there are also differences between sectors. The ENSR Enterprise survey distinguished only in manufacturing, construction, retail, transport and services. In general, manufacturing firms are more often provide financial information than service firms. However, with respect to qualitative information there are no differences. Even though it is not possible to separate between high tech sectors it is likely that in high-tech sectors firms are providing more information.

2.6 Relationship with other management tools

IC statements appear to have significant contact points (“information ingredients”) in common with other forms of reporting, such as social, environmental, CSR, and sustainability reports, which are already quite widely adopted by companies and organisations. It is rather clear that these innovative forms of reporting respond to differentiated, specific purposes and constituents. However, many of the data and variables showing on the face of the above reports are intangible by nature, and hence they can also be part of an IC statement (cf. Cordazzo, 2005).

Instead of viewing the relationship among these diverse reports in competitive terms, the Expert Group suggests that information composing IC statements could be seen as a platform underlying the other reporting documents (i.e., financial, social, and environmental reports), thus representing a sort of “connecting tissue” between all these statements.

The ultimate goal here is not to arrive at a unified report which could deal with company financial, managerial, competitive, organisational, ethical, and relational performance, including also its social and environmental impact. Certainly, this overall report would have the benefit to avoid the undue proliferation of expensive statements, and to concentrate all the needed information about a company’s performance and behaviour in one single, compact source. Here, more modestly, the proposal would be to create a common informational basis on intangibles and IC, from which an organisation can draw in order to prepare the report(s) that it reckons more appropriate to its internal and external needs and constituents.

In this respect, the point is not to impose on companies and other organisations further costs or burdens, but to leverage on the information set that an organisation

⁸ The Expert Group would like to thank Rob van der Horst and Koos van Elk from EIM Business & Policy Research for providing us the data.

has already available and that is currently used to produce social, environmental, sustainability, CSR reports and alike.

Having said so, the Expert Group would also like to point out that IC statements appear much better suited to serve internal management activities and needs than other forms of reporting, which are primarily intended to respond to stakeholders' external demands rather than being operational and decision-making tools. The clearer and stronger managerial orientation of ICR, and its stricter adherence to the key-drivers of long-term company performance, make information contained in this document more useful for management and more directly relevant for investors, financial analysts, rating agencies, and alike.

Therefore, despite the production of other reports (social, environmental, sustainability) should be encouraged insofar as responding to the informational needs of certain categories of stakeholders, the Expert Group believes that IC reports can provide managers and organisational members a means that is closer to company necessity to know, control, and verify the state and variations of its (intangible) key-performance drivers for decision-making purposes. ICR can also offer investors and infomediaries crucial data in order to understand and analyse the pillars which support the long-term trend of an organisation's value creation process.

In this respect, the Expert Group is convinced that IC reports can best serve the managerial needs of research-oriented SMEs for both internal and external purposes, even though a SME can still be willing to prepare and diffuse another statement such as a social, environmental, and/or sustainability report. In this case, the SME can then exploit the informational platform which consists of the IC report's contents, thus minimizing the cost incurred for producing a further reporting document. As the case examples show (see appendix G) IC Reporting has proven to be a valuable tool for many research-intensive SMEs.

We are aware that the burden of reporting is already seen as an issue for both large companies and SME's. We do not feel that compulsion is desirable, rather we feel that IC reporting should be a matter of "enlightened self interest" based on the particular circumstances of each individual company, hence our recommendations regarding guidance rather than any form of prescriptive reporting. IC reporting should be viewed as something which provides general framework within which many existing management practices relating to planning, change, risk management etc. would fit quite comfortably. The simple fact is that many organisations are already performing elements of IC reporting without being aware that that is what they are doing, the key task may therefore be to help ensure that companies, particularly research intensive SME's see the overall IC picture as part of their planning, marketing and research activities. The danger is that without the wider picture key points get overlooked in the way organisations are managed or that an incomplete picture is provided to financiers resulting in failure to fund viable research based opportunities.

3. Current IC Reporting Practices

3.1 Existing regulations on IC Reporting and their development

3.1.1 *Accounting treatment of intangible assets, with particular reference to the regulations applicable in the EU*

EC Fourth and Seventh Directives

In the frame of the harmonisation program of company laws, in 1978 and in 1983 the European Community approved, respectively, the Fourth and the Seventh Directive on individual company and group accounts. After a rather long delay, these two Directives have been implemented through statutory laws into each of the national jurisdictions forming the EU.

As to intangible assets, they must be included in the balance sheet in *ad hoc* section. Their basic measurement rule is historical cost. The override principle associated with the general “true and fair view” formula applies also to intangible assets. The use of revaluation procedures may be allowed by member states also for intangible assets.

In individual company accounts, goodwill can be capitalised, but it must be amortised according to its economic life but within a shorter rather a longer period of time (in general 5 years). In consolidated accounts, goodwill arising from business combinations can be capitalised and subsequently amortised over its useful economic life, but it can also be written off against equity reserves or included in a special provision among the group liabilities.

Particular attention is paid to training (“formation”, according to the Fourth Directive terminology) expenses. They are allowed to be capitalised and shown in either a section of the balance sheet or within the intangible assets section, in so far as national laws permit their being shown as an asset. If capitalised, they must be written off within a maximum period of five years.

The R&D expenses can be capitalised with some caveats, even though national laws fixed quite different rules in this field as a consequence of a differentiated implementation. Information on R&D activities should also be given in the management report.

In so far as training and R&D expenses as well as goodwill have not been completely written off, no distribution of profits shall take place unless the amount of the reserves available for distribution and profits brought forward is at least equal to that of the expenses not written off as yet.

In the frame of a large EU action plan (known also as “Lamfalussy process”) aiming to harmonise and update the regulations on European financial markets, from the beginning of the 2000 the Fourth and Seventh Directives have been subject to a process of modernization in the direction of making them more and more compatible with the provisions of the International Accounting Standards, which meanwhile had become the reference point for the regulatory action of the European Commission in the accounting field.

As a result of this modernization effort, the Directives no. 2001/65 and no. 2003/51 have been issued, with relevant consequences also for the measurement and disclosure of intangibles. In particular, the 2003 Directive allows members States to

require or to permit the revaluation of fixed assets beyond their historical cost, and the valuation of specified categories of assets at their fair value. Both sets of provisions may apply to intangible assets.

Moreover, art. 46 of the 2003 Directives requires that “to the extent necessary for an understanding of the company's development, performance or position, the [management report] shall include both financial and, where appropriate, non-financial key performance indicators relevant to the particular business, including information relating to environmental and employee matters”, thus opening up the way to the disclosure of information regarding intellectual capital variables. At the moment the 2003 Directive is in the process of being implemented in the various national European jurisdictions.

As a further, decisive step toward the internationalisation of accounting rules, on 19 July 2002 the EC Regulation no. 1606/2002 of the European Parliament and the EU Council relating to the compulsory use by January 2005 of International Accounting Standards – IAS (today International Financial Reporting Standards – IFRS) for the preparation of consolidated accounts of all EU listed companies, was issued.

As a consequence of this Regulation it is then of particular interest in a EU perspective to review more in detail the contents of the standards issued by the International Accounting Standards Board (IASB) dealing with intangibles.

IFRS 3 (March 2004)

The objective of IFRS 3 is to prescribe the accounting treatment for business combinations. In these, the acquiring company must always be identified.

A business combination should be accounted for using the purchase method of accounting. Under this method:

- the income statement should incorporate the results of the acquiree from the date of acquisition; and
- the balance sheet should include all the identifiable assets and liabilities of the acquiree measured at their fair value, and any positive or negative goodwill arising.

The fair values of assets and liabilities should be determined by reference to their intended use by the acquirer.

Goodwill arising on the acquisition should be recognised as an asset and subject to an impairment test at least annually according to the requirements of IAS 36. In particular, goodwill must be impaired if its carrying amount exceeds its recoverable amount, which corresponds to the greater between its fair value and its value in use.

An important innovation introduced by IFRS 3 regards the separate recognition of intangible assets apart from goodwill. This is the most important change in allocating the cost of the business combination. It prescribes that intangible assets have to meet two criteria for their separate recognition, otherwise their value must be included in the goodwill. These criteria are:

- the contractual-legal criteria: the intangible asset has to arise from a contract or a legal rights, regardless if that contract or that right can be transferred separately from the entity acquired or from other rights and obligations;
- the separability criteria: if the intangible asset does not arise from a contract or from a legal right, it can be recognised apart from goodwill only if it is separable. This means that it can be divided or separated by the acquired entity and can be sold, exchanged, transferred or rented. Even

when an intangible asset cannot be sold, transferred, exchanged, or rented individually, it is to be considered separable if it can be part of a transaction together with a related contract, asset or liability.

To help companies to better allocate the cost of the business combination, IFRS 3 gives a list of examples of intangible assets that meet these two criteria and are therefore accounted for as asset apart from goodwill. This guidance identifies five categories of intangible assets:

- Market-related intangible assets;
- Customer-related intangible assets;
- Artistic-related intangible assets;
- Contract-related intangible assets; and
- Technology-related intangible assets.

It should be noted that this is not an exhaustive nor a compulsory classification. This implies that companies can depart from this suggested classification or use it in a differentiated way.

Like goodwill, these intangible assets arising from a business combination (and the allocation of the related cost) must be tested for impairment at least annually.

IAS 38 (latest version: March 2004)

The objective of IAS 38 is to prescribe the accounting treatment for intangible assets that are not dealt with specifically in another IASs. The standard requires an enterprise to recognise an intangible asset if, and only if, certain criteria are met. The standard also specifies how to measure the carrying amount of intangible assets and requires certain disclosures thereon.

Intangible asset is an identifiable non-monetary asset without physical substance. An asset is a resource that is controlled by the enterprise as a result of past events (for example, purchase or self-creation) and from which future economic benefits (inflows of cash or other assets) are expected. Thus, the three critical attributes of an intangible asset are:

- identifiability;
- control; and
- future economic benefits.

The standard sets out examples of possible intangible assets for accounting purposes, which include computer software; patents; copyrights; motion picture films; customer lists; mortgage servicing rights; licences; import quotas; franchises; customer and supplier relationships; and marketing rights.

IAS 38 requires an enterprise to recognise an intangible asset, whether purchased or self-created (at cost), if and only if:

- it is probable that the future economic benefits that are attributable to the asset will flow to the enterprise; and
- the cost of the asset can be measured reliably.

This requirement applies whether an intangible asset is acquired externally or generated internally.

IAS 38 includes additional recognition criteria for internally generated intangible assets. If an intangible item does not meet both the definition of and the criteria for recognition as an intangible asset, IAS 38 requires the expenditure on this item to be recognised as an expense when it is incurred. The standard also prohibits an enterprise from subsequently reinstating as an intangible asset, at a later date, an expenditure that was originally charged to expense.

Intangible assets are initially measured at cost.

In relation to R&D, IAS 38 requires that firms:

- charge all research cost to expense.
- development costs are capitalised only after technical and commercial feasibility of the asset for sale or use have been established. This means that the enterprise must intend and be able to complete the intangible asset and either use it or sell it, and be able to demonstrate how the asset will generate future economic benefits.

Brands, mastheads, publishing titles, customer lists, and items similar in substance that are internally generated should not be recognised as assets. The following items must be expensed: internally generated goodwill; start-up, pre-opening, and pre-operating costs; training cost; advertising cost; and relocation costs.

An intangible asset should generally be amortised over the best estimate of its useful life.

The carrying amount of intangible assets with an indefinite life (e.g. brands) should instead be subject to an impairment test - according to the requirements of IAS 36 - annually or whenever there is an impairment indication.

After initial recognition, the benchmark treatment is that intangible assets should be carried at cost less any amortisation and impairment losses. The allowed alternative treatment is that certain intangible assets may be carried at a revalued amount (based on fair value) less any subsequent amortisation and impairment losses. Revaluation is permitted only if fair value can be determined by reference to an active market. Such markets are expected to be rare for intangible assets so revaluations are therefore likely to be rare. Examples cited where they might exist include milk quotas, stock exchange seats, and taxi medallions.

In summary, IAS 38 is a restrictive accounting standard which would lead to most internally generated intangible assets being immediately expensed. This standard codifies the traditional accounting approach which defines an asset in such a way to exclude "assets" that cannot be directly linked to a revenue stream. The standard does not consider the nature of the economic attributes across the different types of intangible investment and the potential relevance of this information to the firms' stakeholders.

3.1.2 Current regulations dealing with IC Reporting

The Danish legislation (2001)

In 2001 the Danish Parliament passed legislation according to which, *inter alia*, there is a requirement that companies disclose in their management report information on their IC, if this is a relevant aspect of their economic activity. Regrettably, though, there are not any indications in the legislation about the format, scope, and contents of this information. The Danish Guidelines are one way to disclose this information but use of the Guidelines is not mandatory.

The German accounting standard GAS 12 (2002)

The German Accounting Standards Committee (GASC) is the Standard Setter for Accounting of German corporate groups and represents German interests in the international Accounting bodies. In 2002 GASC issued GAS 12 which deals with the treatment of intangible assets. GAS 12 mainly follows IAS 38 with respect to the definition and valuation of intangible assets. Thus, intangible assets which meet specific criteria such as the generation of a flow of benefits that are likely to accrue and can be reliably measured can be capitalised. However, many forms of intangible

assets recognised as important form of IC such as human capital, customer lists, and research cannot be capitalised.

GAS 12 recommends that companies may report about their IC within the management report, though, this is not an obligation. Thus, the standard follows the approach that information which is important for the development of a company but could not be integrated with the accounting framework should be incorporated in the management report. The standard recommends the preparation of a 'report about IC' especially for those investments in intangible assets which could not be capitalised and are treated as expenses within the profit & loss statement. This holds, for instance, for investments in research or internally generated goodwill, which cannot be capitalised. The standard explicitly lists different elements of IC, namely Human Capital, Customer Capital, Supplier Capital, Investor Capital, Process Capital, Location Capital and Innovation Capital. For these elements of IC companies should report on, if possible, by quantitative measures. However, details about the structure and scope of the report on IC are not given within the standard.

This approach of the GASC towards IC Reporting is to some extent driven by the Schmalenbach Gesellschaft, the German Association for academic research in the field of business administration, which closely co-operates with GASC. Within a working group on intangible assets the Schmalenbach Gesellschaft adopted the idea of IC Reporting and recommended the publication of IC reports and proposes the taxonomy of IC as pursued within GAS 12. Moreover, this working group also defines in more detail the possible contents of IC reports. These should publish (i) performance measures about IC, (ii) should report about goals and strategy for the development of IC, and (iii) should give information about the individual development of the various elements but also the synergies of IC.

So far, no German corporate group has adopted the idea and integrated an IC statement within the management report of the annual account. Notwithstanding that, some German firms published single IC reports as a supplement to annual reports in the course of the German pilot programme "Wissensbilanz made in Germany".

IC Reporting of Austrian universities according to the UG 2002

In 2002 the Austrian Ministry for Education, Science and Culture released a new university law for the reorganisation of all public Austrian universities (UG 2002, see appendix C). The development of the new legislation was driven by European-wide political activities to harmonise the national university systems such as expressed by the Bologna declaration and by the idea of New Public management with its premises of increased autonomy, output orientation and performance-based funding. The Ministry adopted the idea of IC Reporting to enhance transparency, to foster the management of intangible resources and to set incentives for performance orientation. The IC statement should serve as a management instrument for the university as well as a communication instrument between universities and the Ministry. Moreover, the Austrian science and education policy is interested in more comprehensive information on the development and effective use of its IC.

According to the new university law (Universitaetsgesetz 2002 – UG 2002), all universities will have to issue annual IC reports by 2006. Within this IC report, each university will have to publish input, output, and performance indicators for research, teaching, industrial corporations and other forms of outputs.

The law states:

"Each university shall submit an intellectual capital report for the past calendar year to the Minister, by way of the university council, by 30 April of each year. This shall, as a minimum, present in itemised form:

1. *the university's activities, social goals and self-imposed objectives and strategies;*
2. *its intellectual capital, broken down into human, structural and relationship capital;*
3. *the processes set out in the performance agreement, including their outputs and impacts."*

This framework conceptualises the transformation process of intangible resources when carrying out different activities (research, education, etc.) which result in the production of different outputs according to the general and specific goals. Research and education are two major outputs of a university every university has to report on. Like other IC models, especially applied by research organisations in Austria and Germany, the Austrian IC framework can be labelled as process-oriented approach which does not only focus on the different forms of IC but also on the question how these investments are used by the university and how they influence the outputs.

The law states also that the Minister will by order issue regulations for the structure and design of intellectual capital reports. After a negotiation phase between the Ministry and the Rectors conference the decree currently undergoes an assessment and will be finalised and enter in force in the second half of 2005. Mainly this decree defines the indicators different universities will have to publish in the future.

So far, some Austrian university departments and one university have already published IC reports voluntarily: The Danube University Krems, the Department of Economics and Business Management at the Montanuniversität Leoben, and the Department of General and Tourism Management of the University of Innsbruck.

3.2 Survey on existing IC Reporting methods and guidelines for research-intensive companies

This paragraph presents a survey of existing methods & guidelines for IC Reporting.

3.2.1 The rationale for the selection of methods

The selection has been influenced by the following considerations:

- The methods are used in practice and their use is reported in the case studies presented in this Report
- The enterprises that used the ICR method are research-intensive enterprises as defined in the Introduction.
- The IC Reporting methods and their practical implementations and uses may vary for different sectors of industries / business (e.g. production, services), for different sizes (small to big) and different functions (e.g. R&D, production, marketing...) of organisations. By concept and by experience, the methods presented here fit different cases and contexts, however, practice also proves that in each and every case IC Reporting needs to be adapted in scope and size.
- IC Reporting is used for a clear and specific purpose. This aspect is taken up at the end of this section because it has been driven by the real, or expected, benefit of meeting the expectations and requirements of the prospective IC Statement readers.

About Knowledge Economics

We currently move along the borderline between established classic economics and a new theory of knowledge economics that is not well worked out or formulated. An example of this development is the current discussion on patent protection of software that is heavily opposed by those supporting the so-called Open Software Initiative. In practice we still rely on the well-established models of "traditional" economics, not the least because of the availability and application of legal regulations.

This also holds for new standards in financial reporting (see paragraph 3.1). A good example of the clash between classic economics and knowledge economics is how investments in IT are calculated. The promises made by the vendors and the expectation of the customer / buyer is that an IT solution that is purchased will serve a number of aims and purposes as set out in the vendor's proposal. But, at the end of the day, on the invoice only pieces of hardware and software show up, and certainly not the whole world of fascinating functions which motivated the client to make the investment. The accountants on their part just take to their books what is on the invoice, and certainly not the value of the effects generated by the use of the IT. It is clearly this dichotomy between the imagination and the reality, which creates a productive tension when discussing knowledge economics.

The transformation from traditional valuation methods to new ways of valuation by means of intellectual capital reporting is an issue not yet being mastered sufficiently. One expectation is that "the real new economy" emerges out from the old one. However, it is more likely that, for a certain period, both paradigms develop in parallel and then will converge, thereby solving the valuation paradox.

3.2.2 A taxonomy of methods

Using the purpose of IC Reporting as the main criterion, a rough taxonomy is presented of existing methods in Figure 8. This chart classifies methods along the x-axis ranging from the "classical" valuation of "intellectual assets", such as intellectual property items, towards "modern" value determinations, that include financial and non-financial values. The right end of the x-dimension thereby represents future knowledge economics concepts. In the y-dimension the methods are positioned using the criterion of whether a method provides compound, calculated summary values (low end) or if it produces indicators grouped by means of a structural model, leaving the end result - which are several sets of IC Statement indicators - open for interpretation.

Taxonomy of methods relevant for IC Reporting (following K. Alwert, 2005)

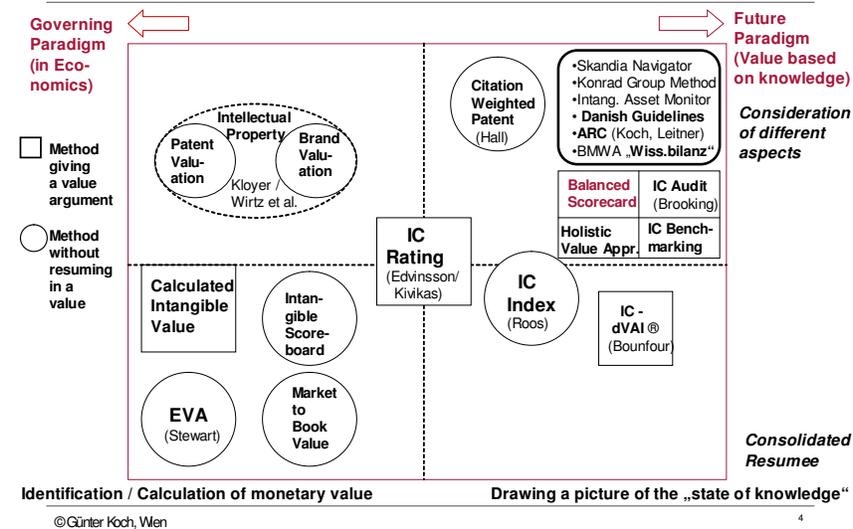


Figure 8: An attempt towards taxonomy of a selection of ICR methods, with specific consideration of their potential according to a future knowledge economy paradigm

It is evident that most of the methods are positioned in the upper right quarter. These methods are intended to disclose which factors and elements make a research-intensive organisation special; one that has a higher potential of using its knowledge to achieve competitive advantage. In contrast, at the left side, methods are positioned which conform to the traditional understanding of knowledge economics, mainly in terms of intellectual property which can be traded / dealt with as economic objects.

Before commencing the process of preparing an IC Statement it must be clear to the SME who are the target readers. It can have an “internal purpose”, to develop and apply management measures to improve the internal conditions and processes of an enterprise; or an “external purpose”, informing external stakeholders, or it can endeavour to serve both. In Figure 9 the same methods represented in Figure 8 are classified in the y-dimension according to the target groups. The x-axis is organised to classify methods according to whether, for structural reasons, they are “just” extensions or add-ons to existing reporting schemes (left end), or, whether the ICR method is an analytical method in its own right, serving for the not yet standardised valuation of the IC of an enterprise.

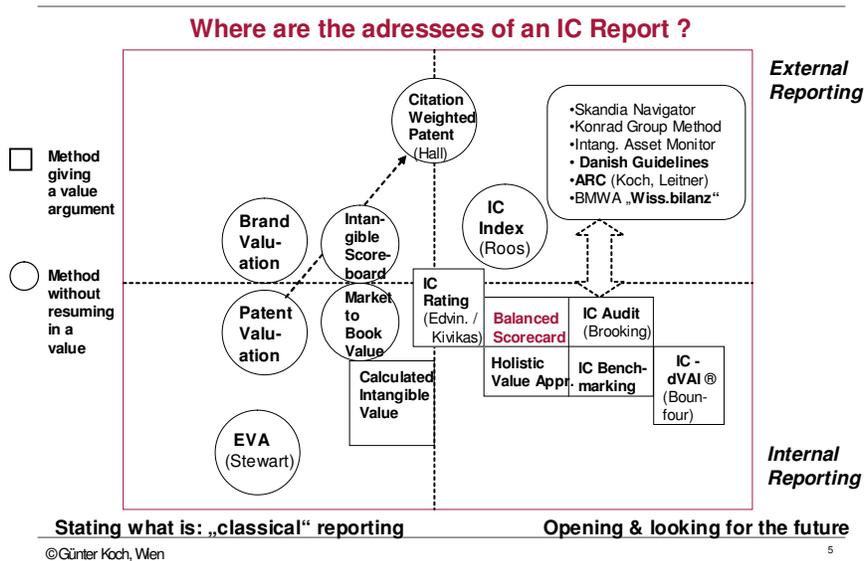


Figure 9: Taxonomy of a selection of ICR methods according to the addressee: ‘internal’ versus ‘external’ readers.

As was said in the introduction, the number of methods for creating an ICR is numerous and they are far from being standardised. We developed a reference model to match and compare the different methods. It is clearly not our claim that the reference model is the only valid one, but it is certainly a model naturally emerging from earlier work supported by the European Commission, such as the MERITUM project.

The reference model presented in Figure 10 is a structural model and does not represent in any way what actions and processes are needed in order to produce an IC statement. The longer term purpose of the reference model is to develop

advanced and broadly exercised benchmarking of IC Reporting methods, which is not yet possible today because of the lack of standards.

This Report does not go as far as to provide a detailed analysis of the differences between the different models and the reference model. A comparison given by Figure 7 demonstrates the general differences in the structural classifications of the indicators used in the various methods, as well as giving evidence that it must be possible to identify a common underlying model.

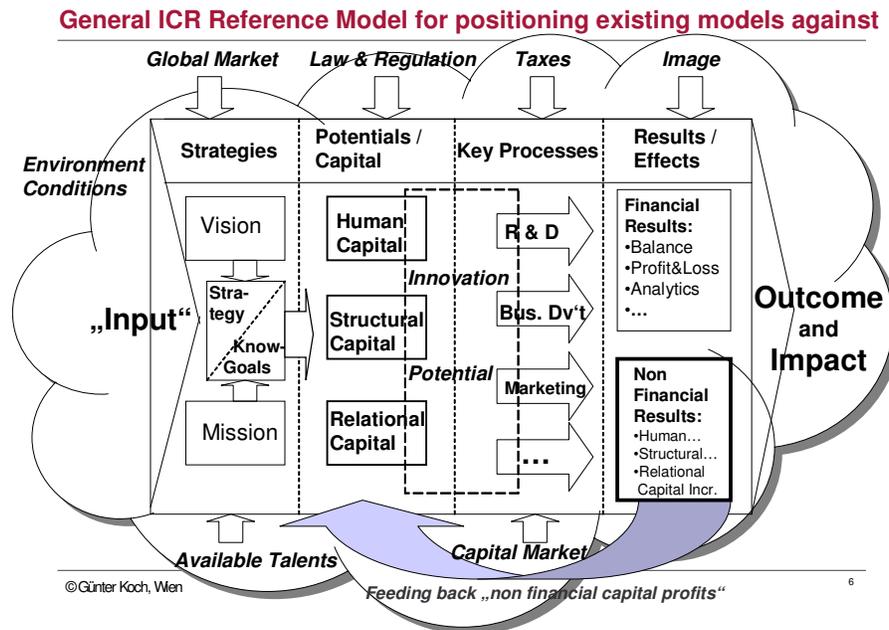


Figure 10: An ICR reference model explaining the different dimensions and elements of an ICR

The set of methods being used across the case studies, as well as in disperse sections of this Report, is visualised in Figure 11.

IC Reporting methods that are used in the Nordic countries are more process and “story” oriented, starting from narratives and then, in a systematic way, creating ad hoc the sets of concerns that can give guidance for the analysis of potentials and needs for changes. The Nordic experts assume that it is difficult to directly classify the IC indicators; especially for a company’s own employees. Therefore they suggest starting with an analysis of deficits in the enterprise; which can then be used as a starting point for the process of identifying what needs to be done and creating an evaluation of its IC. However, also in this approach, the indicators that are developed to measure the status of IC may be sorted into “the boxes” as given by the reference model, thereby making them comparable to indicators collected from other IC Reporting methods.

In contrast to the Danish Guidelines which are clearly defined for the support of change activities, the “continental” methods rather put the accent on the “accounting” of the indicators which then are used for drafting the status of an organisation, the analysis of which, in consequence, will lead to actions for change.

The use of the Reference Model in respect to methods mentioned in this report

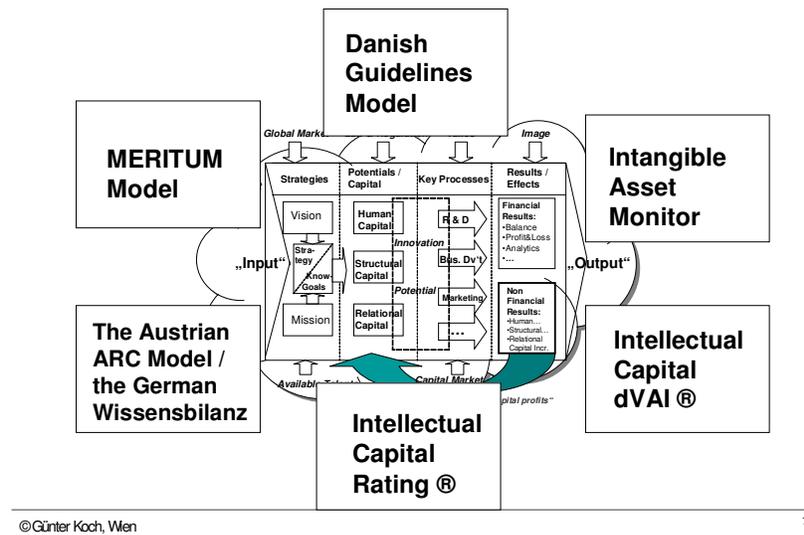


Figure 11: The major methods addressed in this Report

In specific the **MERITUM 2002 Guidelines** being the outcome of the MERITUM project which has been funded by the European Union provide a framework for the identification, the measurement and the control of intangibles and they suggest criteria for the disclosure of information on the intangible determinants of a firm's value. They address both firms in the initial stages of the design and implementation of an Intellectual Capital Management System, as well as firms with some previous experience, concerned about the external disclosure of the information on intellectual capital, which they already produce and use for internal purposes.

The MERITUM model, similar to the Austrian ICR model and the German Wissensbilanz, classifies intellectual capital in human, structural and relational capital, and emphasizes the distinction between *intangible* (or intellectual capital) *resources* and *activities* of the firm. Resources as a static notion are the stock or current value of a given intangible at a certain moment in time. Activities as a dynamic notion imply an allocation of resources aimed at: a) developing internally or acquiring new intangible resources; b) increasing the value of existing ones, or c) evaluating and monitoring the results of the other two activities.

Firms that manage and report on intellectual capital usually follow a procedure that can be split into three non-linear, related phases:

1. *Identification* of intangibles, where companies define their vision and mission and identify the main intangibles they count on and, eventually, those they lack and have to acquired or develop.
2. *Measurement*, where specific financial and non financial indicators are built as a proxy measure of each intangible asset. The indicators are checked against a set of characteristics to make sure that the exercise of an IC analysis is worth and appropriate.
3. *Action*, where the company integrates the intangibles management system within the rest of the management routines. This allows the company to evaluate the results of the decisions made.

In the Intellectual Capital Report following the MERITUM Guidelines a company first needs to explain its vision, then to describe its main set of intangible resources and activities and finally a set of indicators - selected from the total which is used for management purposes - that allow stakeholders to follow the performance and improvement of the company over periods.

The **Intangible Asset Monitor** (IAM) is a most important predecessor for the methods mentioned above and has been created as a path making method by one of the inventors of the intellectual capital analysis, Karl-Erik Sveiby from Sweden. The IAM is intended for drawing a picture on a company's efficiency, stability / risk avoidance, growth and renovation by correlating these aspects to indicators describing the competence of people and internal and external structures. A spin-off method developed in the same geographical area is the **Intellectual Capital Rating**, a highly standardised method, which therefore allows for benchmarking between companies. The purpose is to "measure" the business performance and the potential of a company by acquiring information on its business idea and, again, its human, structural and relational potential.

In summary **IC-Rating™** is based on three focus areas:

- Efficiency - Present value of IC efficiency in creating future value
- Risk - Threat against present efficiency; probability of threat coming true
- Renewal and Development - Efforts to renew and develop present efficiency

The IC-Rating™ looks at the three pillars of IC: Human Capital, Structural Capital and Relational Capital.

The **ARC IC Reporting** model combines goals, intellectual capital and knowledge processes and intangible results. The process of acquiring, applying and exploiting knowledge starts with the definition of specific *knowledge goals*, which can be derived from the corporate strategy. Knowledge goals define the areas where specific skills, structures, relationships should be built up or increased to ensure that the corporate strategy can be put to work. These goals shape the framework for the exploitation of the intellectual capital, which is composed of structural, human and relational capital. These intangible resources are the input for the knowledge production process, which, in turn, is manifested in different kinds of projects or processes carried out in the organization. In the case of research-intensive organizations, the processes are noticeably different kinds of research, such as basic research, applied research, contract research projects, but also services, teaching etc.

The **ARC Model** provides a framework for its adaptation and adoption by other research-intensive organizations. When applying the model, organizations have to formulate explicitly the organizational goals relevant for the knowledge-based resources and processes. These organizations have to define their key processes and, if requested, additional categories for the results. This model, which is especially designed for research-intensive organizations, can explain to investors and shareholders how R&D represents a sound investment. Using the indicators of goals and results, managers of research-intensive organizations can show how R&D and other complementary assets yield returns on investments.

Wissensbilanz -Guideline on the preparation of an intellectual capital statement. The Guideline targets small and medium-sized enterprises (SMEs), as well as other forms of organization, which have a comparable structure. In particular, it targets all decision-makers in an organization, from the managing director via the controller and those responsible for personnel matters, to the quality management commissioner,

strategy managers, knowledge managers, as well as the heads of sales and marketing.

The model is drafted in six steps with four milestones:

Milestone I is the intellectual capital statement in its simplest form. Three steps are needed to achieve it: The first step is to assess the initial situation relating to business environment and strategy, of intellectual capital, and self-evaluation of intellectual capital. The target group of Milestone I is the management of the organization which can extract measures of improvement based on the results.

Milestone II targets the same group, but goes one step further in supporting the self-evaluation with indicators. In this way, self-evaluation is given further concrete form and supported using facts by means of which changes can also be measured independently of the employee's self-evaluation. The collection and assessment of indicators is at the same time preparation for internal or external communication.

Milestone III provides a processed document or a presentation of the organization's intellectual capital. It is adjusted towards a specific (external and/or internal) target group and describes the most important information

attractively and in a structured form.

Milestone IV works out a full intellectual capital statement, which is also suited to monitor the organization. It integrates correlation analyses and assessments which provide information on how long it will take until measures which have been initiated ultimately lead to business success.

In contrast to the structuring methods, the **IC-dVAI® (Intellectual Capital dynamic Value)**, is a strategic approach to IC analysis from a dynamic perspective. It has been developed building on the main arguments put forward by the *resource-based view* and the *dynamic capabilities view* of the firm. The approach has been implemented mainly in France under different contexts and at microeconomic as well as at macroeconomic levels. Indeed, as far as metrics are concerned, these are defined dynamically along four important and interrelated dimensions of competitiveness:

- *Resources as inputs* to the production process: tangible resources, investment in R&D, acquisition of technology, etc.
- *Processes*. It is through processes that the deployment of a dynamic strategy founded on intangible factors can really be implemented: processes of establishing knowledge networks, and competences inside and outside organizations; processes of combining knowledge; just-in-time processes for products and services and the whole of the outputs; processes of motivation and training of personnel, processes for building social capital and trust, etc.
- *The building of intellectual capital*. This can be built by the combination of intangible resources. The combination of intangible resources can lead to specific results such as collective knowledge, patents, trademarks, reputation, specific routines, and networks of cooperation. For each of these assets, indicators and methods for valuation can be developed.
- *Outputs*. It is on this level that performance of organizations is classically measured, through the analysis of their products and services' market positioning. Here, one will be interested in indicators such as those relating to market shares, quality of products and services, barriers to entry building, establishment of temporary monopolistic positions.

The IC d-VAL® defines and measures IC in terms of relative indexes as well as in monetary terms. The starting point is a clear definition of the main components for

the four dimensions – *Resources, Processes, Assets and Outputs*. After this, a benchmarking process is conducted for these items. Basically the relative position of a company or a nation to those considered as best performers is analysed. The benchmarking exercise leads to calculating ad hoc performance indexes, as well as to a composite index per activity, company, group, country, region or any community.

The following table summarizes a selection of existing guidelines and provides links to their websites:

Origin	Name	Key Focus	Benefits	Links
Austria	ARC ICReport	Structured presentation of goals, potentials, processes, and resuming intangible & tangible results.	Holistic view on the "intellectual status and current 'value'" of the organization. Justification of tax payers' investments in public R&D	www.arcs.ac.at/publik/fulltext/wissensbilanz/ARCS_Wissensbilanz_1999.pdf
Denmark	Danish Guidelines	Portfolio of, investments in, and effects of knowledge resources. Relates practices and purposes of IC resources	Supports management and reporting of IC. Develops IC indicators. Identifies properties of IC statements for analysis and benchmarking.	www.videnskabsministeriet.dk/icaccounts/
Europe	MERITUM	Differences between intangible resources and intangible activities	Supports management and reporting of IC. Provides a set of characteristics that indicators should have	www.uam.es/meritum
France	IC-dVAL®	Performance indexes and value of IC	Support management and IC Reporting Building sense of IC Internal and external signalling of value and performance for IC	www.icforcommunities.com
Germany	Wissensbilanz	IC processes	Supports management decision making	www.akwissensbilanz.org
Iceland	PiP project	Indicators	Harmonized indicators that allow for benchmarking	http://nhki.si.is/
Spain	Intellectus Model ®	Dividing IC into its minimum components	Adaptability to each organisation	http://www.ofenhandwerk.com/oklc/pdf_files/K-4_deCastro.pdf
Sweden	IC-Rating™	IC position	Visibility of IC, finds areas to improve and enables benchmarking	www.intellectualcapital.se

Although at a first glance the multitude and multiplicity of methods for ICR may seem confusing, especially for non-experts wanting to find the best method for their purpose, on a conceptual level most ICR methods show enough commonalities to render benefits. Therefore, the decision to start an ICR project is not so much influenced by whether it will add value but by the question whether the enterprise is well prepared, if it has the capacity and know-how to run an ICR project, and if it has access to competent support for getting a ICR project managed professionally.

3.2.3 Overruling “classical” methods: The claim of the reference model to be holistic and systemic

Two developments need to be observed by research-intensive enterprises in order to improve their management towards becoming “perfect” competitors: the use and benefits of new management paradigms and their methods such as Visioning & Fore sighting to improve strategy building, operationalisation of strategic management using the Balanced Scorecard, portfolio & option theory methods, etc.

methodological duties imposed on enterprises by legislation or by “smooth” pressure such as financial reporting after the IFRS/IASB standard, credibility valuation after Basle II, conformance statements by sticking to standards such as ISO 9000 or EFQM, Corporate Government rules, Social Responsibility practices etc.

Experiences in the Nordic countries, Austria, Germany, UK, and Spain show that IC Reporting concerns all aspects and addressees, all departments, levels and cultures of an organisation. The projects run in both the Nordic and the German speaking countries, highlighted the need to address a series of additional concerns in enterprises that usually are only partially covered by the traditional methods of change management. A major benefit for employees involved in IC Reporting projects was that it provided a methodology to analyse why things often do not work the way they are supposed to in a “good knowledge company”. For example, so that the internal users could understand the cause - effect relationships, additional methods were taken into the German Wissensbilanz “tool box”. It turned out that IC Reporting provides a bird’s eye view perspective, which is much more holistic and systemic than any of the more specific methods; not only to management but to all stakeholders.

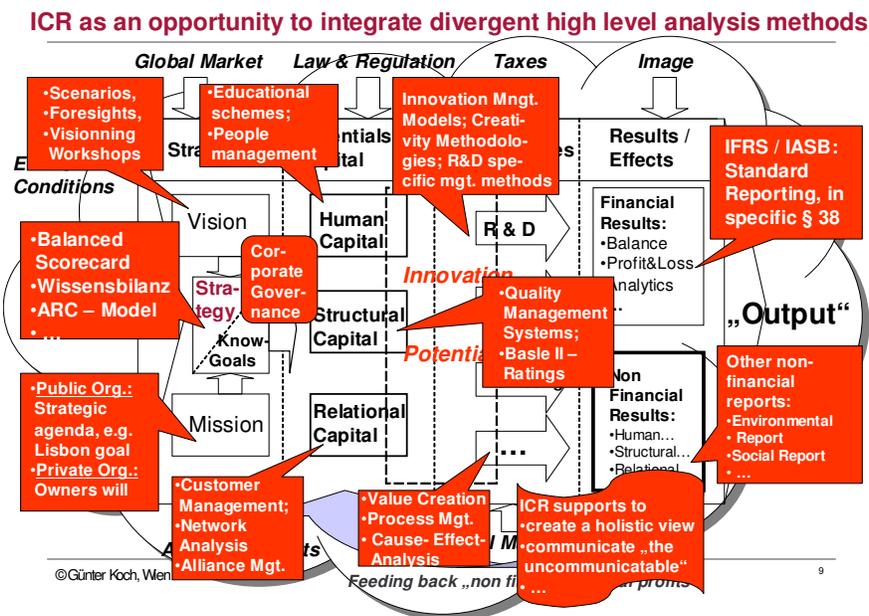


Figure 12: The ICR reference model as a framework involving a series of particular methods inducing specific changes to a knowledge organisation

To illustrate this holistic view of enterprises used by IC Reporting, Figure 12 illustrates how the reference model covers specific management models that support changes to achieve greater competitiveness. Although we are neutral with respect to what management method is best, we suggest the use of IC Reporting as the higher level “meta method”, the application of which may automatically induce a profound review of more specific aspects of the enterprise, that can then be covered by more specific management methods.

3.2.4 Some differences between the methods in use

The methods for IC Reporting described here are not fundamentally different, but they do serve different purposes, or use different approaches. We may differentiate between three types of models:

- the Danish / Nordic methodology which is based on the idea of improving organisations by means of “action plans” that are created in a systematic way following a systemic model starting out from an initial analysis based on narratives. This approach is also similar to the method suggested by the British Department of Trade & Industry.
- in 1999 the Austrian Research Centres (ARC: Koch, Schneider & Leitner) was the first organisation in a Germanic country to introduce an IC Reporting model. Some of its core parts are based on the European MERITUM project. The ARC model, with some minor variations, has become a standard for RTOs. It is holistic as it covers all of the major aspects that make research-intensive enterprises “tick”; providing structured and interpretable information in context. In contrast to the Danish / Nordic approach, the model was first constructed to provide a structure for a report that is complementary to the usual annual report.
- There are several other methods, such as A. Bounfour’s IC dVAI[®] (which serves the purpose of providing metrics on a high level for calculating the capital value generated by intellectual values) which are not explained here in greater detail.

The majority of methods are based on the assumption that there exists something like a knowledge asset, i.e. an object that can be accessed for economic analysis. Figure 13 shows the mainstream ways to organise the indicators of knowledge assets into those classes which are of particular interest to stakeholders. E.g. employees and their representatives are most interested in the development of Human Capital in order to improve the employability of the employees.

In contrast, “traditional” methods of IC Reporting as described in the left-hand side of Figure 8, built upon “tangible” IC, mainly by valuing intellectual property items such as patents, copyrights, trademarks, brands etc.

The basic differences in the structuring of categories of intangible capital in major models

ARC (Koch, Schneider, Leitner)	Human Capital	Relational Capital		Structural Capital			
Skandia Navigator (Edvinsson, Malone)	Human Capital	Customer Capital		Structural Capital			
Intangible Asset Monitor (Sveiby)	Human Capital	External Structure		Internal Structure			
Calculated Intangible Value (Stewart)	Human Capital	Customer Capital		Structural Capital			
Intellectual Capital Audit (Brooking)	Human Capital	Market Assets		Infrastructure Assets	Intellectual Property Assets		
German Wissensbilanz-Model (←ARC)	Human Capital	Relational Capital		Structural Capital			
German Draft Accounting Model	Human Capital	Customer Capital	Supplier Capital	Process Capital	Innovation Capital	Location Capital	Investor Capital

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Figure 13: Comparison of classifications of indicators in different IC Reporting methods

3.3 Differences in the adoption of IC Reporting

3.3.1 Level of adoption

Without being dogmatic in the adoption of a classification, it could be said that there is a continuum of research and innovation intensive SMEs stretching from those where IC Reporting is relatively popular, to those where it has not yet developed. Gaining an understanding of the key enablers and barriers in the development of an IC Reporting culture and identifying those entrepreneurial factors that may influence its popularity, is a prerequisite to designing and implementing a strategy whose objective is that of increasing the take-up of IC Management and Reporting across European research and innovation intensive SMEs. From a review of the general level of take-up of IC Reporting across a variety of companies, it would appear that the general management principle, ‘the degree of cultural fit between an organisation and a proposed management strategy will greatly influence the success, or otherwise, of its implementation and sustainability’ applies. In this sense, a cultural heritage of transparency is a key enabler in the “organic development” of IC Management and Reporting. In Spain –the academic community has been very active in the field over the last few years (Bañegil, T.M. and R. Sanguino, 2005) it is ‘infecting’ the business community with the IC Spirit and some leading companies are quite active (see appendix F).

3.3.2 Comparison with some non-EU countries

Some interesting conclusions can be drawn by first looking at four countries outside the EU. Of special interest to Europe are recent developments in Australia and Japan. In Australia a *Society for Knowledge Economics* was established in June 2005 following a mandate from the Australian government, which includes among others CPA Australia, the Institute of Actuaries of Australia and Microsoft Australia. The Australian government believes that the knowledge-based economy requires

new business models, management skills and organisational practices. The first task of the Society was to develop Guiding Principles on Extended Performance Management aimed at the management and reporting of intellectual capital (see appendix G).

In Japan a governmental Subcommittee on Management & Intellectual Assets has proposed a new model for the voluntary reporting of intellectual assets (see appendix G). In its interim report the committee specifically states that the goal is to arrive at regulatory disclosure of IC related information. The decision to publish a Japanese model now is motivated because this “(...) will have a big impact in the worldwide trend. Also it may be possible to set a *de facto* standard.”(Subcommittee on Management & Intellectual Assets, 2005).

In the US, the Accounting Authorities seem to be moving away ahead of the legislators, as evidenced by the initiative, “Enhanced Business Reporting” (Wallison, Peter J., 2004). In Israel, an IC statement has been drawn up for the whole country and is used as an effective communication tool to present the Science and Technology opportunities to prospective collaborators, financiers and customers.

Iceland provides an exciting contrast to the other three, at least in the IT sector. For several years now several dozen Icelandic organizations are participating in an IC interest group within the Iceland Business Excellence Organization. They have agreed a set of harmonised indicators for IC measurements and the government has published (unfortunately for the rest of us only in Icelandic!) a guideline, or manual, on how to measure and report intangibles in a synchronized manner to assist organizations taking their first steps in reporting on their IC and to ensure comparison between companies. Perhaps the most interesting feature of this initiative is that it has been led by SMEs in reaction to their perception of the need to reduce the ‘information asymmetry’ between themselves and the financial sector, following the ‘burst’ of the dot.com bubble. In summary, the four approaches are:

- governmental legislation and initiatives;
- initiatives by the accounting authorities;
- the government setting a good example;
- a ‘bottom-up’ approach driven by the ‘self-interest’ of SMEs who have recognised that IC Reporting can decrease information asymmetry.

3.3.3 What lessons can be drawn?

When considering developments and government initiatives in other parts of the world, it is important to bear in mind that the EU is lacking institutional power and there is a far greater diversity of approaches, histories and cultural backgrounds across its 25 members than are present in the national business community of any of the aforementioned four countries. As a ‘one size fits all’ kind of solution cannot work across Europe, it will be necessary to encourage IC Reporting by using approaches that will empower national policies and allow their translation and adoption in the various member states at different speeds. Great care will also need to be taken to ensure parallel developments in related research intensive sectors, such as Universities and Research and Technology Organisations, as well as the preparation of the different components of the financial sector so that they demand and can interpret IC Reports.

3.3.4 Comparison across the EU

Going back to the interesting contrast that has been documented between northern and southern EU countries (Chaminade and Johansson, 2003), the following conclusions could be drawn:

- companies in the Nordic countries would be expected to consider knowledge sharing as more natural and co-operation more usual. They would not fear new managerial experiments, such as those required in identifying, managing and reporting IC and they would be keener to have flexible frameworks (e.g. Guidance rather than Guidelines).
- most companies in Mediterranean countries may have to be educated on the importance of knowledge sharing and would be more comfortable with detailed instructions (e.g. in the form of Guidelines with some 'ready to use' templates) with which to implement IC statements.

The example set by Skandia had a very positive influence on both Scandinavian organisations and authorities. In general, firms and researchers are the drivers rather than the governments, however the Swedish government is currently supporting the development of Health Statements (Johanson, U & Backlund, A, in press). Although in recent years the support from the Nordic Innovation Centre (NIC) has been strong in funding initiatives in the Nordic countries (such as Nordika, Frame and now PIP), it is in Denmark, where hundreds of companies now produce IC Reports, that Government support has been strongest. A number of the larger projects, aimed at harmonising the methodology, have been supported by the NIC.

In Italy, where a number of companies have started to identify, manage and report their IC, with support from Academia, this has been for internal use only and not included in their Annual Reports. In fact, the government is not leading such initiatives in any of the 'Mediterranean' countries, with the possible exception of France where several reports have been issued by Institutions underlining the importance of the intangible economy and the importance of investing in Intelligence. However, from the French business side, there has been only spasmodic interest during the second part of the 1990s with a few companies reporting on IC. One of them (GrandVision), a service group listed on financial markets, issued several IC Reports (within the general financial Accounts) over the period 1997-2000, but then ceased and at present it seems that no other companies are really reporting on IC in a systematic way.

Austria is an exceptional case as a law published in 2004 will require publicly funded universities to produce a Wissensbilanz (Knowledge Account), complementary to the existing reporting, as part of their 'funding contract' with the Ministry from 2006. As a result, this sector has a greater reporting requirement placed on it than industry has. However, a number of SMEs are working with academia to improve their management and reporting to stakeholders. In Germany there has been good publicity and excellent support (including financial) from the Ministry of Labour and Economics for the Wissensbilanz which has aroused a large degree of interest among SMEs.

In the Netherlands, after considerable early interest in the topic, it now seems to have taken a back seat to other forms of complementary reporting (such as Environmental Reporting – where Royal Dutch Shell has taken a lead) and the Ministry of Economic Affairs prefers to concentrate on those issues that the business community considers important.

The situation in the Eastern European countries is quite similar to that of the Southern European ones in the sense that only a few business leaders are active in implementing IC related management tools in their organization. Although most of

them are conscious about the importance of IC – especially human and relational capital - in their business success, they are quite sceptic about formalized management systems, and afraid of being real transparent. This comes from the traditional entrepreneurial approach of centralized decision-making and control and also from the lack of trust towards the authorities.

The academic community in the Eastern European countries is just starting to explore the issue of IC. Researches, publications and academic discussions focusing on IC management or IC Reporting have been very rare yet, only the accounting experts, auditors and financial analysts were aware of the issue of evaluating intellectual capital, especially human capital.

3.3.5 Pre-requisites

In view of the conclusions of this commentary on some of the key barriers to the development of an IC Reporting culture, it is clear that the following are pre-requisites to its ever becoming popular and effective:

- Organisation-wide understanding of the role and the value of IC and of each of its different components (basically Human Capital, Relational Capital and Structural Capital) and about the associated management issues;
- Effective discussion at a managerial level about the nature of tacit, as opposed to only explicit, knowledge and how it is created, expressed, shared and internalised;
- The ability to overcome the barrier of the effort (cost) and knowledge needed (capability) to develop and sustain the IC Reporting process.

3.4 IC Reporting in Research & Technology Organizations

3.4.1 The role of RTOs

Research & Technology Organizations (RTOs) are important elements of the national innovation system, they are linked in national and international scientific and industrial networks and are specialised in different fields, mainly in the areas of pre-competitive research, applied research and technological development. Amongst others, their tasks and aims are to transfer academic knowledge to practical application, to provide platforms for co-operative R&D projects and to take the risk of innovative research in the early stage where it seems to be too great to bear for private and especially small firms. Moreover, RTOs often serve as network nodes and offer researchers and partners access to various pools of knowledge that they can combine with their knowledge base in order to develop and commercialise new technologies.

RTOs perform important roles within innovation processes in the economy and thus receive a certain amount of public research funds to perform their goals and contribute to the innovation processes of firms as a co-operation partner, supplier of technological knowledge, the provision of specialised labs, etc. RTOs frequently co-operate with SMEs; on average across Europe about 20% of their activities are carried out in collaboration with SMEs. Finally, they are often incubators for knowledge-based start-up and spin-off companies.

RTOs have been confronted with new kinds of challenges in recent years. They have to compete increasingly for research funds and have to cope with new research modes: Competition on commercial markets, market orientation and competitive-based funding are becoming a paradigm for this sector, which, in turn, also clearly demands a more progressive way of communicating with the stakeholders and of

measuring their performance. As is the case for other knowledge and research-intensive organisations, RTOs cannot capitalise their R&D expenditures according to most Accounting Standards. Since R&D and innovation are the major resources of RTOs, the traditional financial accounting system is even more constrained when it comes to delivering the necessary information for internal management and external stakeholders.

3.4.2 IC Reporting and RTOs

To meet these challenges, some European RTOs started to manage their IC more explicitly and to publish IC Reports. The first European RTO that introduced an IC management system and published an IC statement was the Austrian Research Centres (ARC, see appendix G), which published its first report for year 1999.

The IC statement and model served also as reference for other RTOs across Europe and as a framework for IC Reporting for Austrian universities. In recent years in Austria, Germany, Denmark and Sweden, RTOs have started to publish IC Reports. Amongst others Joanneum Research (Austria), DLR (Germany), Risø National Laboratory (Denmark) and CMM (Sweden) have started to report on their IC.

These IC Reports are based mostly on IC models, which separate different forms of IC, frequently as Human Capital, Structural Capital and Relational Capital and illustrate their role and impact within the value chain of an RTO. Like IC Reports of private industrial firms these IC Reports reveal information about organisational goals, illustrate the development of IC based on narrations and reveal indicators for the different forms of IC and, especially, about research results.

3.4.3 Motives for using IC Reporting

Even though RTOs do not compete on capital markets, information asymmetries are also of relevance for RTOs since they have to compete for research grants and funds (see CMM case below). Financiers, funding agencies and customers have to take their decisions on the best available information, which should preferably deal with the organisational capacity and research potential of an organisation. RTOs have to reduce the information asymmetries in order to facilitate technology transfer with industry and to communicate their competencies and products.

RTOs have to evaluate and communicate their research and business activities and results. This is also relevant for R&D departments, competence centres or research subsidiaries of large enterprises. Research is not self-explanatory; its benefits must be interpreted and communicated in a comprehensible way. In comparison with other organisations, the IC Reports of an RTO have to reflect the specifics of its business (see case the CMM study). The most important one is the broad range of results due to the specific tasks, which mainly reflect relations between science and industry. In industrial firms, the outputs and results of the R&D activities are input for further processes in the value chain with the aim of commercializing the knowledge within products launched on markets. In the end, the R&D results of firms are incorporated into products, which are sold by the company, increasing, in turn, the revenue and profits of the firm and amortising the R&D investments. In contrast, RTOs often do not produce and sell new products on commercial markets but are only engaged in the early innovation stages. However, private R&D departments, research centres of global firms and smaller high-tech firms respectively, can learn from RTOs, and vice versa, regarding the measurement and management of R&D and innovation. Thus, as RTOs are (potential) co-operation partners of SMEs, they also serve as references for SMEs and illustrate how to manage and report on R&D based activities.

Case study 4: CMM - Center for Molecular Medicine

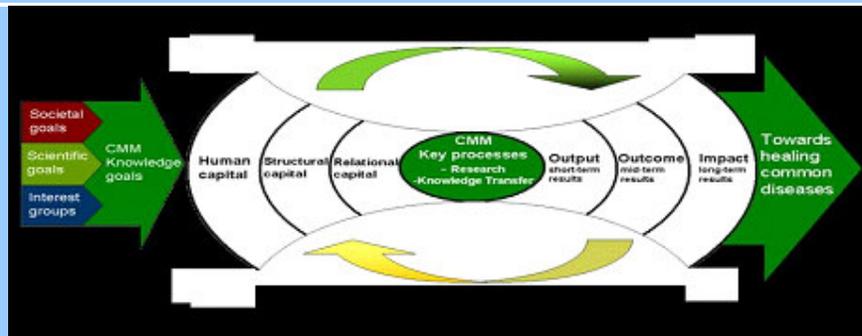
For the **full IC Statement** see www.cmm.ki.se

Company Profile: CMM has a staff of 343 qualified persons generating more than 200 scientific discoveries per year. It has a strong laboratory expertise in molecular and cell biology emphasizing genetics and genomics. CMM is an innovation arena for pre-emptive medicine co-located at Karolinska University and the Karolinska Institute, Stockholm, Sweden. It has developed a special culture of collaboration over classic disciplinary boundaries since its inauguration in 1997.

Case study background and objectives: From a Lisbon agenda perspective this type of IC Reporting of R&D laboratory might be of prime mover value for other research enterprises. One extra ordinary challenge for CMM is that medical R&D mostly has a longitude value beyond the time paradigm of the financial community. For CMM it is extremely challenging to be able to attract the financial and venture capital that often has a time horizon of 5-7 years.

Main reasons for publishing an IC Report: CMM started to prototype IC Reporting in 2003 and has so far done 3 annual IC reports. The main motive was and is to gain external acknowledgement and thereby validate a better and extended funding. Furthermore being a true knowledge and scientific enterprise within the medical research community this IC Reporting has a value to visualize the intangible activities on what is going on in the lab. IC awareness is also about improved insights both of staff, activities and results beyond the traditional reporting.

Model used: CMM has started to elaborate on the results in a special IC Statement model with results as output(short term) , outcome(mid term) and impact on society health (long term). The CMM knowledge goals are formed by the goals of society, science, and various interest groups, such as patient organizations. In order to reach these goals, human, structural, and relational capital is highlighted as key processes of CMM - research and knowledge transfer.(see the CMM model below)



Main activities undertaken to acquire, improve or monitor IC resources: The main IC Reporting activities so far undertaken is once per year to assemble a systematized picture of CMM research with clear quantitative indicators. The work is done by a team under supervision of the scientific coordinator. Over time it will then be possible to benchmark internally as well as externally with other lab oriented enterprises. These indicators are structured as human capital, relational capital and structural capital over time, as output, outcome and impact.

Research at CMM is both highly productive and of high international quality. 443 scientific articles in refereed international journals were published in 2004. 49 PhD dissertations were defended in 2004, an increase with 68 per cent compared with 2003. Comparing the journal impact factor over time shows that research at CMM is now no. 3 in the world and has recently surpassed Imperial College in London, and is closing in on two of the most prestigious universities in the US - Stanford University and Harvard University.⁹

The research at CMM has also commercial outcome. In 2004, five patents were registered and six were pending. All in all, six companies have been started by the researchers at CMM, rendering about 50 part- or full-time positions. The intellectual property developed by the researchers is open for alliances with external investors.

⁹ Data from 1997-2003 produced by Jonas Lundberg, Centre for Medical Innovations, Karolinska Institutet.

CMM Research is a long-term investment where the full effect is visible many years later but visualized in medical health statistics.

Main results: *An increased attention externally and acknowledgement of the prototyping work of CMM on IC Reporting, both within as well as outside Sweden. Other research groups in Sweden are now in progress to test similar IC Reporting approaches. Internally the results are also showing a growing understanding of the collective value of IC Reporting as well as the organizational value of it. This IC Reporting has also inspired CMM to prototype innovative funding of future research.*

Key message: *Key message: For R&D organizations similar to CMM, this type of IC Reporting, with visualizing value creation over a longitude time frame, is increasing both the IC awareness, as well as the IC productivity processes as a basis for the augmented R&D funding.*

4. Guidance for IC Reporting

4.1 Attracting external finance

To attract finance for R&D and innovation, the key challenge is to articulate the sort of value proposition and risk profile that would appeal to lenders (Debt providers) and investors (Equity providers).

An IC Statement, if properly used, can help SME's to explain why finance is needed, how it will be used and to provide a basis for assessing the degree of risk and the certainty surrounding the finance proposal, hence the way in which the finance proposal is best suited to debt, equity or a mixture of the two.

An IC statement helps overcome the differences in knowledge between entrepreneurs and financiers (information asymmetries) by providing key points and associated narratives which demonstrate that the SME:

- Understands its technologies and areas of expertise – its skills, competencies and capabilities;
- Understands its areas of competitive advantage, its intellectual property (IP) and technical standards related to its products, processes and markets
- Understands its customer's needs, wants and aspirations and the value that its products and services are able to deliver to them;
- Understands its markets and how to access them
- Has a credible strategy for getting its products and services to market, profitably, despite the competitions;
- Has a credible strategy for managing everything needed to manage the overall sequence of activities needed to succeed (e.g. value chain positioning and management of operations);
- Is able to substantiate assumptions used in the preparation of financial projections and is able to provide a flow of information to lenders and investors to keep them informed of the way in which the business is progressing.

Ultimately all forms of external finance should be viewed as providing the cash required to bridge the gap between the need for money now and the generation of money in the future. It should also be borne in mind that ultimately a business fails (not initially because of losses) because of its inability to pay bills as they fall due.

For lenders (Debt propositions) an IC statement helps to show that the loan is relatively risk free, because of the way the money is to be used and the way in which cash will be generated. This focus on cash flow helps to demonstrate to the bank the ability to cover interest as it falls due and to repay loans in accordance with agreed repayment schedules.

For investors (Equity propositions) an IC statement helps to show the size of the business opportunity and the most sensible way to invest to maximize the potential return on the investment. The focus is still on future cash flows but the return is based on maximizing the market value of the business – hence the market value of the investment.

4.2 Investing in innovation – Investment Readiness

4.2.1 Investment questions

As with any investment, investors seek answers to four basic questions:

1. What are the competencies and capabilities that will enable this business to grow and prosper?
2. Where is the value in this business and how will this value be nurtured and sustained?
3. How efficiently will this business manage its range of operations compared with its competitors?
4. Do we trust those in charge to identify and manage key risks and to deliver what they promise?

When trying to answer these questions banks often use a checklist covering questions like those included in the “Best Practice” acronym.

Best Practice © IntangAbility®

Business Plan	Is the business plan credible?
Experience	Skills, competencies & experience of key people?
Security	What is our risk and how can we limit our exposure?
Team	Management leadership and team building skills?
Purpose	How and when is the money to be used?
Repayment	Where will our repayment come from?
Amount	How much are they asking for and is this sufficient?
Commitment	What are the shareholders putting in themselves?
Term	When will the borrowing be repaid?
Income	How profitable will this opportunity be for us?
Control	How will we keep track of business performance?
Ethics	Do we wish to be associated with this opportunity?

Equity investor would have a similar type of checklist that would concentrate more on things like:

- The investors fit with the management team and how well they feel they will be able to work together
- The size of and timeframe for the market opportunity, the upside potential of the investment proposition and the scope to leverage the opportunity based on investing
- The existence of Intellectual Property (IP) and prospects for generation of new IP and protected income streams arising from Intellectual Property Rights (IPR)
- Exit options and the ability to groom the organisation to ensure that the exit value fully reflects the value creating potential of the business.

Both lenders and investors will also consider the entrepreneurial context from a number of perspectives:

STEEPL Analysis

Social – Power and Influence, Culture(s), Diversity, Individuality, Contributors & Takers, Hunters and Gatherers

Technological – Problems, Challenges and Opportunities, Interrelatedness, packaging, design(s)

Economic – Markets, Sectors, Value chains, Business models and Innovation systems – inflation(s)

Environmental – Physical environment(s), biodiversity, sustainability, Licence to operate, Licence to Innovate

Political – Spending & investment priorities, Safety, Security, Responsibility – Stakeholders

Legislative – Internal and external standards, measurement, avoidance, compliance, audit, KPI's, CSF's – “What gets measured gets managed”.

The “Best Practice” checklist and the STEEPL analysis are used by bankers and investors to explore areas, which are not sufficiently covered by the business plan. In essence, external financiers and investors need to have both sufficient and the right kind of information to feel comfortable that it is right to lend or to invest.

4.2.2 *Information and cultural asymmetries*

Research-intensive enterprises encounter particular problems when constructing a dialogue with an investor, including:

1. Difficulties in sharing technical understanding, particularly in respect of dialogue with financiers who lack technical knowledge.
2. Difficulties in producing accurate forecasts of financial returns based on R&D.
3. As a result of 1 and 2 the risk of financial pressure from financiers to shift R&D towards more incremental, conservative projects.
4. Lack of complementary assets in areas such as production, marketing and distribution.

The need is for fluency in a variety of languages – technology, production, marketing, finance etc. – and without such fluency there is more scope for misunderstandings and missed opportunities.

Whether the enterprise seeks a loan or an equity investment, a usual starting point is for management to provide the lender or investor with a business plan, the purpose of which is to facilitate the communication process by highlighting key aspects of the lending or investment proposition.

For research intensive and knowledge intensive organisations typical areas where management will need to convey their IC might include:

- Understanding of technologies, areas of expertise, areas of advantage relative to others and the way in which knowledge, know-how, skills competencies and capabilities will be used to build a successful business
- Details of existing IP, including aspects such as licensing agreements, also an explanation of R&D programmes aimed at producing new valuable IP
- Understanding of markets, market trends, etc. and clarity in terms of how to segment the market and meet the needs (articulated and latent) of customers.
- Understanding of competition and the way in which the market is evolving due to innovation and adoption of new business methods and ways of working.

Whilst it is clear that the business plan needs to draw upon managements IC awareness and IC thinking many business plans miss key elements and therefore fail to answer a wide variety of questions and concerns that the lender or investor may have. Equally from the lenders side lack of technical understanding can lead to

uncertainty as to what questions to ask in order to properly assess the lending opportunity.

4.2.3 Improving the quality of dialogue through IC Reporting

Whatever the aims and purpose of the business, it tends to be the clarification of the non-financial (intangible) factors, rather than clarification of financial (tangible) factors, which lead to decisions to lend money or to invest. Identification of historic costs and associated financial statements, whilst useful as a starting point, provide very little that is reliable in the production of future financial forecasts.

Strong management teams, who understand the nature of value based on the important role that IC plays in investing for the future, are much better placed to provide a true and fair view of the business opportunity being outlined by the business plan, as well as credible justifications for the assumptions used to predict the forecast numbers; which are all important to both lenders and investors.

The case of GENETRIX (See appendix G) shows that in the start-up phase of an enterprise, the creation of an intellectual capital statement can help structure the business plan, create transparency to potential investors, and show added value of the business proposition, while the originality of this way of reporting can also contribute to the ability to raise seed capital. The case of Coloplast (case study 3 in chapter 2) shows that IC Reporting can help to lower the asymmetries with analysts, resulting in improved stock market performance.

4.3 Five dimensions in preparing an IC Statement

There are a number of excellent guidelines available for preparing an Intellectual Capital Statement (see Appendix). From these guidelines we can learn that five dimensions are important. These dimensions will be discussed below. The Appendix contains a description of existing guidelines and provides one or more case studies and specific tools to illustrate the use of each guideline.

4.3.1 Dimension 1 – Taking Stock of IC

One of the important first tasks in preparing an IC Statement is to take stock of the enterprise's intangibles. A number of issues are important:

Piloting the preparation of an IC report

Before starting a project on reporting an enterprise's IC it is useful to consider whether the enterprise is fit for IC Reporting (see tool 3 on page 130). Experience shows that when organising an IC Reporting project the following considerations are helpful:

- Appoint a sponsor (Champion) from among the Senior Management to track progress and ensure sufficient allocation of resources. Appoint a project manager to oversee the process. Their function will be to provide a sense of direction and purpose, to explain what is involved and to co-ordinate activities:
 - select a suitable starting point for the enterprise – the prototype which will deliver a quick win;
 - define boundaries for the project, for example by department, function, location, product line etc;
 - select the people who will be involved from those accountable, responsible, involved or affected;

- produce a project plan which clarifies roles, responsibilities, accountabilities and success criteria;
- gather information in order to produce the knowledge narrative which identifies key management challenges, key initiatives, value drivers and success criteria.
- Produce the report & organise information flows – linking value drivers and Key Performance Indicators
- Track progress to ensure that acquiring a better understanding of IC actually increases the value of what the enterprise does:
 - by highlighting features and benefits of the prototype;
 - by transferring learning to other key areas of the enterprise.

Linking Intellectual Capital to objectives

An important step in creating an IC Statement is to link the Intellectual Capital of the enterprise to its objectives. Enterprises benefit from a clear sense of direction and purpose within which everyone can identify what they need to focus on achieving, in order to contribute to success. Understanding ‘who does what, for whom and why’ represents an important first step in understanding, articulating and managing the value creating potential arising from IC.

A good starting point might be to review the enterprise in terms of:

- Its overall aims and objectives;
- Most important markets or market segments;
- Most important products and services;
- Most important customers;
- Most important projects relating to innovation and change.

Then consider the following questions:

- What is the position now?
- What has made us successful / unsuccessful so far?
- What needs to be achieved?
- What options are available?
- How should we proceed?

When these questions are too difficult to answer in one go, it might be helpful to start by looking at existing initiatives and objectives with respect to knowledge resources. Everyday people in your enterprise do things to optimise or make use of knowledge resources: somebody is sent on a training course; a PC is bought; new people are hired; dialogues with customers are started; an intranet is set up. All these actions are taken for a reason. By listing those activities you create an overview of some of the Intellectual Capital that apparently is important to the enterprise (see tool 2 on page 127).

Producing a Knowledge Narrative

A Knowledge Narrative is used to provide credible reasons as to how knowledge will lead to value creation. The narrative articulates connections between activities and provides the logic for what needs to be done and why it is important. In doing this the Knowledge Narrative highlights (see tool 1 on page 126):

- Management Challenges (Problems to Solve and Opportunities to be Seized);
- Management Initiatives (Action Plans, Improvement Programmes and Projects);
- Value Drivers & Performance Indicators (Critical Success Factors and Key Performance Indicators).

Where to look for Intellectual Capital

All enterprises have Intellectual Capital and fundamentally we would argue that enterprises that have a clear understanding of the following classes of IC have clear advantages over those who do not:

1. Their capacity for innovation and change (skills, competencies and capabilities in terms of creativity, inventiveness, flexibility, judgement, ability to learn, ability to adapt, ability to form alliances, contextual awareness of customers, markets, technologies etc).
2. Their other intellectual assets (management methods, instruction manuals, templates, trade secrets, processes, expert systems, software, databases and other similar codified procedures used to improve accuracy, reliability, quality, efficiency, effectiveness, economy etc).
3. Their intellectual property (legally protected Intellectual Capital, such as patents, trademarks, design rights, copyrights and database rights).

To this list we would add:

- The quality of information about customers, suppliers, partners etc.; the ability to manage knowledge; the effectiveness of relationships both within and outside the enterprise; the quality of information systems used to manage the enterprise.
- The efficiency and effectiveness of their products, processes and services in delivering value to customers and to the enterprise.
- Ability to comply with internal standards (e.g. targets & Key Performance Indicators) and external standards (for example ISO and the Law).
- The ability to make effective use of various management tools and techniques like SWOT, Balanced Scorecard and Quality models.

4.3.2 Dimension 2 – Planning Investments in IC

Once the enterprise has a clear view of its Intellectual Capital and how it is supposed to contribute to value creation, it is possible to start planning investments in its further development.

Management challenges and initiatives

Based on the Knowledge Narrative and the IC overview, it is possible to articulate the following issues:

- Problems to solve & opportunities to be seized;
- Key management challenges;
- What is important / urgent;
- What to do more / less of;
- Gaps in resources and capabilities.

Investing in Intellectual Capital

The analysis of management challenges and gaps in resources may lead to the formulation of a number of activities and projects. These may include investments in:

- Scientific Research & Technical Development (SR&TD);
- Market Research & Product Development (MR&PD);
- New Management Methods, Processes and Systems;
- New Standards and Control Systems;
- Public Relations and Brand Development Activities;
- Staff Training and Development Activities.

As with all activities and projects, it is important to establish:

- SMART Objectives: Specific, Measurable, Agreed, Realistic & Timely.
- Justify the investment involved in each project – Assessment of risks vs. rewards.
- That funding is available and that investments represent the best use of resources.
- That each project will be monitored and managed effectively.

Project appraisal

Whenever an investment is being made there is a need to consider both the risks and the potential returns. Even when the SME has its own cash available to invest in its R&D projects, there is a need for project appraisal, which will take into account things like:

- Fit with Strategy – Objectives and Values;
- Brand and Reputation Enhancing – Investment of Brand Equity;
- Financial Returns – Return on Financial Capital;
- Investment timescale and window of opportunity – Time to Payback;
- Identification of Key Risks – Project Management and Scenario Options.

Effective project appraisal provides an important role in helping to make sure that the business makes sensible investment, and capital allocation, decisions. IC statements help by highlighting what is important within the enterprise, what skills, competencies and capabilities exist, where the gaps are and how they are being addressed.

IC Statements draw from the identification of key knowledge, relationships and valuable ways of working, the knowledge narrative highlights both important achievements to date and interrelationships between activities and outcomes. The identification of a route-map for the future, made up from action plans and improvement programmes together with the identification of key gaps in skills, competencies, resources and capabilities, serves to both:

- highlight the key management challenges facing the enterprise;
- provide a basis for “keeping score” of progress being made through the selection of metrics and key performance indicators.

4.3.3 Dimension 3 – Internal Communication of IC

Internal reporting on Intellectual Capital

The purpose of IC Reporting, or the articulation of IC thinking within other management tools (such as business plans, project plans and process manuals), is to increase the efficiency, effectiveness or economy of current operations; or to improve future options and flexibility to respond to future change.

IC Reporting is a communication tool that is complementary to current management tools. It will help to create the right climate of behaviour, which in turn supports value creation within the enterprise. To do so it needs to communicate entrepreneurial aims and objectives, explain how each aspect of the business contributes to success, and

identify critical success factors (such as motivated people) and influencing behaviours through careful selection of Key Performance Indicators.

Key communication issues relating to IC are:

- How does the quality of our IC enable problem free running of operations so we always deliver on time and to specification? – The Operational Dimension.
- How does the quality of our IC provide us with power and influence, options and flexibility, within each of our chosen markets – The Strategic Dimension.

Selecting indicators

A long list of indicators can be a burden for a company. It may increase its management cost without providing clear benefits. Companies need to make sure that the indicators they are constructing fulfil a set of characteristics to make the effort interesting and worthwhile. Tool 5 on page 137 provides an overview of these characteristics. Indicators are generally made up of three types of figures:

- Effects such as quality, satisfaction and productivity
- Investments for developing knowledge resources, for example through performance reviews, supplementary training, process development or meetings with customers and users
- Assets, such as composition of education, major accounts and technology platforms etc.

To identify indicators and structure them in a coherent fashion, the following table of commonly used indicators can be used:

	Human capital	Organisational capital	Relational capital
Investments	<ul style="list-style-type: none"> • Number of training days per employee • Recruitment costs as percentage of total labour expenditure • Expenditure on training as percentage of total labour expenditure 	<ul style="list-style-type: none"> • Investment in information systems • Total costs of research and development as percentage of turnover • Number of patent applications in progress 	<ul style="list-style-type: none"> • Number of presentations, conferences and training days held where customers participate • Number of articles published • Marketing expenditure as percentage of total costs
Assets	<ul style="list-style-type: none"> • Number of employees on payroll at the end of the year • Gender & age distribution • Proportion of particularly important employee groups, e.g. IT employees 	<ul style="list-style-type: none"> • Number of patents • Number of process descriptions • ISO certificates 	<ul style="list-style-type: none"> • Image on the labour market and customers • Number of relationships with universities, business schools and other educational institutions • Number of brands
Effects	<ul style="list-style-type: none"> • Employee satisfaction • Number of employees having left the company in proportion to total number of employees • Turnover per employee 	<ul style="list-style-type: none"> • Average operational lead time • Percentage of turnover from new products & services • Proportion of orders delivered at the right time, place and in the right volume and quality 	<ul style="list-style-type: none"> • Customer satisfaction • Number of press quotations about the enterprise • Number of visitors to website or average length of stay or proportion of revisits to website

IC Reporting as a means to work on the business

There is a great deal of difference between what might be referred to as “Working in the business” as opposed to “Working on the business”.

Working in the business: The behaviour here might be described as a tendency to:	Working on the business The behaviour here might be described as a tendency to:
<ul style="list-style-type: none"> • Focus on the demands of today; • Use of existing knowledge; 	<ul style="list-style-type: none"> • Focus on surviving and thriving; • Adding new useful knowledge;
<ul style="list-style-type: none"> • Use of existing processes, methods, routines, habits etc.; 	<ul style="list-style-type: none"> • Finding better, more efficient, effective and economical ways of working;
<ul style="list-style-type: none"> • Maintaining personal "comfort zones" and the enterprise "status-quo"; 	<ul style="list-style-type: none"> • Continuously seek improvement based on innovation and change;
<ul style="list-style-type: none"> • Fire fighting to deal with problems and mistakes as they arise; 	<ul style="list-style-type: none"> • Avoiding problems and mistakes;
<ul style="list-style-type: none"> • Stagnation and obsolescence over time. 	<ul style="list-style-type: none"> • Increasing competitiveness through adding and shedding activities.

A good way to think about efficient use of IC is to manage the enterprise to ensure that all those who work for the enterprise have the attitude of mind that they will create value for the both enterprise and for themselves by organising efficient, effective and economical ways of working, which in turn sustain lasting relationships with customers by meeting their needs – profitably.

4.3.4 Dimension 4 – Internal Management using IC

Intellectual Capital Reporting is not a one time thing. Instead it is an important tool to continuously support the management of the enterprise. It can play an important role in the functioning of the Board.

Role of the Board and Intellectual Capital

The Board of a company undertakes a number of roles with respect to IC which include, for example:

- Using the specialist knowledge, experience and expertise of the Board as a whole to identify key management challenges and opportunities with respect to intellectual capital as they arise.
- Make objective assessments of problems and opportunities and key management challenges, which arise from them.
- The evaluation of strategic options in order to decide on investments in intellectual capital.
- Questioning assumptions so as to surface vested interests and personal agendas within the enterprise, which might lead to conflict and damage future prospects.
- Stimulating Board discussions on IC by challenging the status quo and by providing alternative insights and ideas.
- Ensuring that internal control procedures provide reliable, accurate and timely flows of information on IC, which enables the Board to track performance.
- Determining monitoring criteria, selecting metrics and key performance criteria for IC.
- Providing leadership and direction at times of crisis and ensuring that appropriate frameworks and policies to enable decision taking, at the correct level, within the enterprise.
- Representing the enterprise externally vis-à-vis stakeholders and providers of finance.
- Ensuring that the enterprise is governed in ways which enhance the brand and promote a positive corporate image.

All of these roles touch on the importance of IC by revealing the interconnections between the overall portfolio of activities of the enterprise and its Intellectual Capital.

In turn, this makes it easier to visualise the problems and opportunities arising from both existing operations and from changes occurring within the marketplace.

Benefits to internal management

Existing users have identified the following benefits of internal IC communication:

Strategic

- Improved customer relations based on an understanding of how the enterprise delivers value to customers.
- More accurate targeting of innovation, R&D and product development, based on the level of knowledge available about customer needs, desires and preferences.
- Clear identification of the areas where processes are not delivering what is needed to meet entrepreneurial aims and objectives; hence more accurate targeting of resources to achieve required improvements.
- Increased awareness of intangible resources and how to make effective use of them in order to enhance power and influence in the marketplace and to enhance the entrepreneurial flexibility and strategic options.
- Increased awareness of strengths, weaknesses, opportunities, and threats (SWOT) in respect of intangibles, as well as identifying the gaps in resources and capabilities and the options available to address them.

Operational

- Allocation of roles and responsibilities and delineation of authority at all levels in the enterprise.
- The codification of useful systems and routines (methods and ways of working) which leverage knowledge and know-how in order to make best use of resources and capabilities to achieve aims and objectives.
- Identification of important Intangibles, Complementary Assets, Intellectual Capital, Intellectual Assets and Intellectual Property, as well as communicating their importance to ensure that they are properly recognised and managed.
- Awareness of Intangibles and IC and the ability to communicate the abilities and achievements of the enterprise to key customers and collaborators to enhance prospects of winning new business.
- As a complement to financial accounting and financial statements in order to enhance the effectiveness of internal MIS and controls.

The role of audit in intellectual capital reporting

The role of audit is essentially to consider:

- Efficiency and Quality – the appropriate use of all resources including IC.
- Reliability, Security and Legality – the “fitness for purpose” of activities needed to achieve entrepreneurial aims and objectives and the manner in which the enterprise is governed, including for example protection of IP.
- Controllability – the effective use of all resources and capabilities including intangibles and IC in order to achieve targets and goals.
- Value for Money – ensuring that whatever audit is undertaken that it provides value for money in terms of, for example avoiding the cost of mistakes.

Internal Audit

All enterprises have established routines, ways of working and the role of internal audit, covering both administrative and accounting controls:

- Administrative Controls
 - Assess compliance with internal rules (e.g. Process and Instruction Manuals);
 - Assess compliance with internal standards (e.g. Quality);
 - Assess compliance with external (e.g. Safety) standards and legislation;
 - Ensuring clear links between resource consumption or use, achievements, results and effects;
 - Identify areas of best or good practice and make recommendations for codification and adoption to add value elsewhere in the enterprise;
 - Ensure accuracy and reliability of non-financial information flows (MIS).
- Accounting Controls
 - Identification of risk, including latent risk;
 - Security of systems and routines in order to safeguard assets arising from intentional or unintentional actions;
 - Ensuring a true and fair view of accounts by undertaking a complete audit, including all the assets and liabilities of the business.

External Audit

The role of external auditors is similar to that of internal auditors with the key difference being the independence of the external auditor from the organisation being audited. An external audit provides an independent view on the way in which the organisation is managing its operations and the extent to which the organisation is complying with a variety of internal and external standards, including legislation. Audit provides feedback to the organisation but it also provides a basis for providing an independent view of the organisation to stakeholders and with this in mind it is important to select auditors with:

- The right sort of experience and qualifications
- The right sort of standing and reputation with stakeholder groups

Audit and intellectual capital reporting

The scope of IC is very wide and links to a variety of stakeholder issues and concerns encompassing things like:

- Corporate Governance
- Corporate Social Responsibility (CSR) and Socially Responsible Investment (SRI)
- Relationship with the Environment
- Compliance with Legislation and Standards
- Accuracy of Financial Statements etc.

Communicating the outcome of the audit to stakeholders provides an independent view on the extent to which the enterprise has complied with or passed whatever external standards are being audited. Exactly what is audited needs to be considered against the legitimate needs of stakeholders and with this in mind there is a need to select indicators based on what is relevant and material to the particular circumstance of the organisation.

IC links directly to both innovative capabilities and the way it approaches relationships within and outside the organisation. Human capital, organisational capital and relational capital are all important areas to consider irrespective of the type of Audit. Various types of Audit may be desirable:

- Financial Audit
- Environmental Audit
- Intellectual Property (IP) Audit
- Licensing Income Audit
- Software Audit

With this in mind it may be necessary to choose more than one type of auditor. The range of audit will vary from one organisation to another and we would not support the imposition of any audit on research intensive or knowledge intensive SME's which fail to add value through the process of auditing. We do however feel that audit can be particularly useful in:

- Measuring compliance with mandatory rules and regulations
- Identifying problems to solve and opportunities to seize
- Reducing Risk
- Avoiding the Cost of Mistakes
- Providing Reassurance both Financial and Non-Financial Stakeholders

Of particular importance to research intensive or knowledge intensive SME's might be to use audit to ensure that SME's in receipt of public sector support for, for example R&D, have properly trained individuals and appropriate processes in place to ensure that IP is properly identified and managed. Audit could for example be used to ensure that there are effective process connected with patenting, IP infringement, IP valorisation, etc.

4.3.5 Dimension 5 – External Reporting of IC

Disclosure to attract resources to support innovation & value creation

Clarification of IC provides an important way to improve the quality of dialogue with the outside world. Disclosure of IC assets can increase transparency in areas where stakeholders have a legitimate interest. However, first and foremost, IC disclosure is aimed at improving the image and negotiating position with a view to attracting relationships; which will help to support the enterprise's value creating potential.

To existing employees:

IC communicates a sense of identity, who we are and what we are capable of; thereby providing a clear sense of mission and purpose, as well as a sense of pride in their work and in the enterprise they work for.

To potential employees:

IC provides an insight into the working environment and the benefits of being associated with this enterprise in particular. "Attract good staff and pay them well" is a well known phrase, but good people are able to choose where they work and money is not the only thing that will attract them.

To customers:

IC sends a signal that highlights areas of expertise and achievements. Testimonials and references from existing satisfied customers can really help to attract new ones, whereas dissatisfied customers may have a great deal of power to cause reputational damage.

To partners:

IC illustrates the benefits of joining forces or combining resources where there is mutual benefit in order to create value. Partners may be providers of knowledge or complementary assets.

To investors:

IC illustrates that managers know what is valuable and how to use their resources and capabilities to sustain the enterprise and to encourage the creativity and ability of their workforce to build a successful future.

To society:

IC explains issues related to probity and governance, environmental awareness and a sense of corporate social responsibility, in return for the enterprises “Licence to Operate” and “Licence to Innovate”. “License to Operate” is the freedom to conduct their business in the way they do with the approval of society. The ability to self-govern provides valuable operational flexibility, whereas absence of freedom is typified by formal regulation and control, which in addition to restricting flexibility frequently comes with additional costs to ensure compliance. “Licence to Innovate” is the important freedom to experiment and change things, which is an important issue for any enterprise which is involved in so called “ethical” areas of R&D.

Selective disclosure

An IC Statement is in essence a form of communication, and as with any form of communication it should be for a purpose. This holds true whether an enterprise actually produces a formal report or whether they use IC thinking to improve the quality of other forms of communication – such as strategic plans, project plans, marketing plans, human resource plans and etc.

Whatever the intended messages of an IC Statement, it needs to be easily understood by its intended audiences. Key considerations relating to the external reporting of Intellectual Capital are:

- What information to disclose to external audiences?
- What information to reserve for internal management of the enterprise or for selective disclosure when the need arises – for example when seeking external finance or when negotiating a specific contract or collaboration?

Tool 4 on page 130 can help to structure the external Intellectual Capital Report.

The difference between an IC Statement and other new reporting systems

In recent years, companies, consultants and researchers have provided many interesting theories on accounting in the future. A whole range of different supplementary accounts have emerged that all resemble each other, because they all report new types of figures. This paragraph gives a quick overview of the differences and similarities between IC Statements, stakeholder reports and green or social reports.

None of the supplementary reports have yet arrived at a fixed template or model and new designations keep appearing. All the different types of accounts use figures, as in financial statements, but the figures are not included in a clearly integrated bottom line. Each company’s accounts must therefore contain a description and an argumentation that can link the figures to the company’s challenges and express the company’s results in relation to this.

Based on the main trends in literature on new types of reports and statements, it is possible (with care) to classify them with respect to the central problems they pose.

Table 1 gives a survey of three main types of supplementary accounts identified in the literature.

- Green and social accounts explain how the company handles and remedies problems such as leakages of harmful substances or worker attrition;
- Stakeholder accounts are directed towards the dialogue between the company and its groups of stakeholders, for example the company's employees, customers, investors, the local community, etc;
- IC Statements show the company's initiatives to build up, develop and increase the efficiency of its knowledge resources.

All three types of reports are aimed at developing the company; to make it better prepared for the future. But they have slightly different approaches and attack a number of related complex problems; each from its own specific angle.

The three types of reports expand the focus of the financial statements in various ways. Even if each describes more aspects of the company than the financial statements do, none of them can in principle be deemed to be total reporting.

Table 1. Three types of supplementary reports

	IC Statements	Stakeholder reports	Green/social reports
Purpose	The purpose of the IC statement is to explain the company's resource base and the activities that management implements to develop it.	The purpose of the stakeholder account is to explain the company's co-operation with selected groups of stakeholders.	The purpose of the green/social accounts is to explain how to handle the company's undesirable effects on society.
Content	The content of the IC statement relates to the company's accumulation and development of knowledge resources, for example in the form of relations with and between employees, customers, technology and processes.	The content of the accounts relates to flows of actions and relative wages paid by and to the stakeholders involved. This describes the general goods or benefits that the state, employees, customers and the local community receive.	The content of the accounts relates to the company's initiatives to ensure a balance in its ecological and social space.
Strategic perspective	The strategic perspective of an IC statement is to develop the company's value by supporting development, usage and sharing of knowledge resources and competencies. This enables the company to support its intangibles and its knowledge management.	The strategic perspective of stakeholder accounts is to support the development of the company's value by creating a balance between the demands of different stakeholders relative to each other. This reduces uncertainty around the stakeholders' behaviour.	The strategic perspective of green/social accounts is to develop the company by engaging in a broad dialogue on the company's role in society.

5. Policy Recommendations

In drawing up our recommendations our aim is to:

1. Provide helpful guidance to SME's in recognizing and making decisions based on their IC
2. Highlight to investors and other stakeholders the importance of asking questions about and understanding the nature of IC
3. Recommend to policy makers ways of highlighting the importance of IC and making best use of IC to stimulate innovation and growth.

There is concern regarding the level of investment in research and innovation and a key aim of this report is to help ensure that good ideas are managed in ways which lead to wealth generation for Member States. Throughout this report we have focused on both the need for companies to be aware of the importance of their intangibles or intellectual capital both from an internal management perspective and from the valuable "option" that this internal perspective provides in terms of external reporting. In section 2.3 we highlighted four common barriers to the reporting of IC namely financial resources, knowledge, human capital and management competencies and we see "guidance" as an important way of helping to overcome each of these barriers.

In view of the diversity of public and private interests across Member States we feel that a concerted effort will be required on the part of the relevant services of the European Commission (including the DGs responsible for Research, Internal Market, Enterprise, Information Society and Education), the Member States, the European Accounting Bodies and Associations, Business and Professional Associations (such as the EFQM), Chambers of Commerce, the Gate2Growth Initiative¹⁰, E* Know-Net¹¹, The New Club of Paris¹², and those funding agencies that offer competitive funding for R&D and innovation to SMEs, Universities and RTOs to:

- make effective use of IC Reporting techniques to articulate value propositions in order to gain competitive advantage;
- promote measures that reduce information asymmetries between research-intensive SMEs and their respective financiers or funding agencies;
- generate a widespread appreciation of the advantages of identifying, managing and reporting intangibles throughout 'value chains' in ways that facilitate learning from peers and benchmarking within and across sectors;
- avoid burdening SMEs with additional reporting requirements that do not create real short and medium term benefits to their business operation, competitiveness, sustainability and profitability.

This requires an approach from the European Commission aimed at improving IC awareness, followed by improving IC Reporting competencies and IC management routines that provide the basis for the use of IC Reporting. As SMEs learn how to make the best use of their intangibles and prepare relevant IC Statements, an

¹⁰ http://www.gate2growth.com/g2g/g2g_welcome.asp

¹¹ www.urjc.es/innotec/tools.php

¹² The New Club of Paris is an association of scientists and decision-makers dedicated to research and promotion of the idea of transforming our society and economy into a knowledge society and a knowledge economy.

important step towards more effective management behaviour will have been achieved. As IC Reporting is spread among research-intensive SMEs the standardization of IC Reporting can be facilitated (see figure 14).

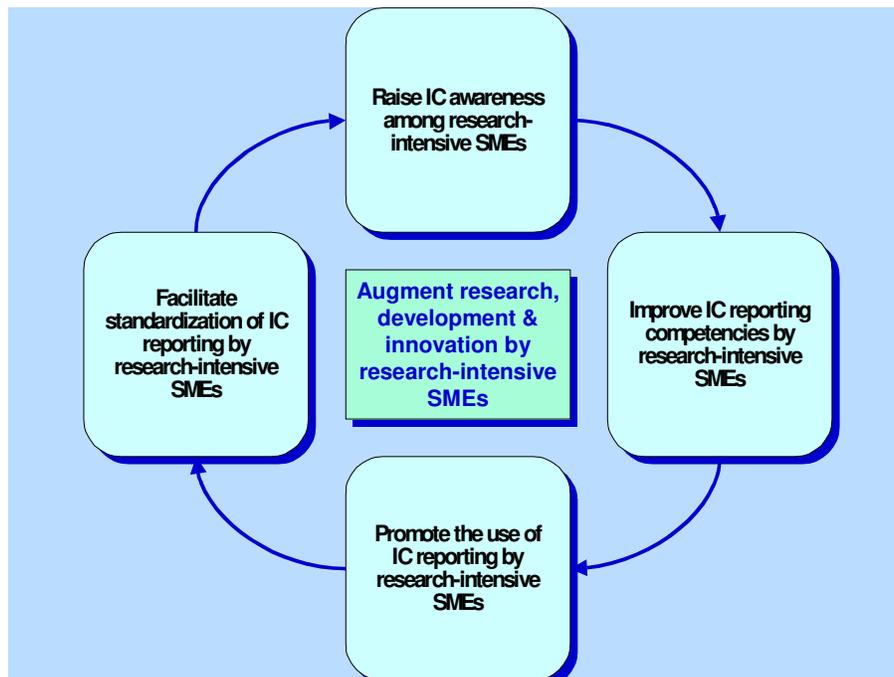


Figure 14: A concerted effort to augment R&D in research-intensive SMEs

The Expert Group considers governmental policy initiatives necessary because the capital markets for funding research and innovation of research-intensive SMEs do not perform well and research-intensive SMEs often do not possess the competences to develop and highlight the business case for R&D. Furthermore, standardisation and diffusion/dissemination of IC Reporting are important policy tasks when coordination failures do not lead to well functioning of markets, resulting in lack of transparency. In the field of IC Reporting diffusion and standardisation are very important and can be interpreted as a framework condition, as they help to reduce the risk. Furthermore, the support of competence development and investments in IC is vital as these complementary investments are important to become a successful innovator¹³.

The Expert Group has formulated six policy recommendations that can be seen as options for the Commission to practically address improved identification, measuring and reporting of intellectual capital as intended by Commission's Communications on Investing in Research: an action plan for Europe COM[2003]226 and the Communications on business-related services COM[2003]747. Together these steps will create an upward spiral boosting financial capital for, and investments in R&D by research-intensive SMEs.

The recommendations draw partly from earlier work done for the Commission on increasing the transparency of IC, especially the recommendations provided by the PRISM project (PRISM, 2003) and the Study on the Measurement of Intangible Assets and Associated Reporting Practices (Zambon, 2003). These recommendations support and expand ongoing activities and actions of the

¹³ See also Bessant and Dodgson (1996) who argue that innovation policy should address the capability gap of firms.

Commission, especially those related to the 3% action plan (COM[2003]226), related to business related services (COM[2003]747), the forthcoming Research and Innovation action plan, and i2010 (SEC[2005]717).

The following table provides an overview of the six policy recommendations of the Expert Group listen the actions, the actors and the rationale for the activities. Each recommendation will be described further in the remaining paragraphs.

WHAT SHOULD BE DONE?	WHO ACTS?	WHY SHOULD THEY ACT?
1. Establish an European Adoption Task Force that oversees and catalyses the development of IC Reporting and management in research-intensive SMEs and acts as a learning platform. The Adoption Task Force should work on three work packages: 1. Raise IC awareness among research-intensive SMEs 2. Improve IC reporting competencies by research-intensive SMEs 3. Promote the use of IC reporting by research-intensive SMEs	<ul style="list-style-type: none"> European Commission 	<ul style="list-style-type: none"> To maximise the speed by which practices spread across European settings: To facilitate mutual learning between member States on prototyping experiments To maintain momentum in developing IC in research-intensive SMEs To help sharing practices between member states To show good practices and develop ambitions for IC Reporting towards convergence of methods
<i>Work Package 1: Raise IC awareness among research-intensive SMEs</i>		
1.1 Promote existing guidelines and increase awareness	<ul style="list-style-type: none"> European Adoption Task Force Member States 	<ul style="list-style-type: none"> To increase awareness of IC, complementary to ongoing activities to increase awareness about appropriate use of risk capital To leverage what already has been achieved on IC Reporting in the EU
1.2. Develop an IC Portal	<ul style="list-style-type: none"> European Adoption Task Force Member states 	<ul style="list-style-type: none"> To increase awareness To facilitate the sharing of best-practices
1.3. Create an IC Reporting Award for countries, regions, enterprises and persons	<ul style="list-style-type: none"> European Adoption Task Force Member States Business associations News papers / media Universities / business schools 	<ul style="list-style-type: none"> To create awareness of good practices. To support those SME who are willing to act as frontrunners
1.4. Motivate specific industries that involve a lot of research-intensive SMEs to adopt IC Reporting (e.g. software industry)	<ul style="list-style-type: none"> European Adoption Task Force Business associations 	<ul style="list-style-type: none"> To engage with specific business associations and use them as leverage to stimulate adoption
<i>Work Package 2: Improve IC reporting competencies by research-intensive SMEs</i>		
1.5. Act as catalyst in the development and inclusion of state-of-the-art IC management and reporting modules into science, engineering and business schools curricula	<ul style="list-style-type: none"> European Adoption Task Force Member states 	<ul style="list-style-type: none"> To ensure that every student – especially from business – receives basic awareness/ training regarding IC management and reporting To complement ongoing intellectual property awareness and training activities
1.6. Support (examined) IC Guides initiatives. IC Guides are people that can help enterprises use IC Reporting	<ul style="list-style-type: none"> European Adoption Task Force Member States Business associations 	<ul style="list-style-type: none"> Develop expertise and help for research-intensive SMEs To find and educate IC Guides
<i>Work Package 3: Promote the use of IC reporting by research-intensive SMEs</i>		
1.7. Establish prototyping activities with research-intensive SMEs in EU countries	<ul style="list-style-type: none"> European Adoption Task Force takes initiative and coordinates together with Member States, possibly supported by the new OMC-net. 	<ul style="list-style-type: none"> To develop practices and awareness in the research-intensive SME segment and to share best practice all over Europe

WHAT SHOULD BE DONE?	WHO ACTS?	WHY SHOULD THEY ACT?
1.8. Increase the role of banks, investors and infomediaries through networking activities	<ul style="list-style-type: none"> European Adoption Task Force Business associations Professional associations 	<ul style="list-style-type: none"> To complement current actions to improve access to finance with IC Reporting. To include IC in rating systems that enable potential investors to appraise the risks and rewards associated to investments in research-intensive SMEs
2. Produce a practical guide on IC Reporting for research-intensive SMEs, banks, investors and infomediaries	<ul style="list-style-type: none"> European Commission 	<ul style="list-style-type: none"> Show research-intensive SMEs in an easy-to-understand way how IC Reporting can benefit their business
3. Use IC Reporting as an important criterion for public support	<ul style="list-style-type: none"> European funding mechanisms and financing institutions should take the lead and act as first mover 	<ul style="list-style-type: none"> To improve the quality of investment proposals by research-intensive SMEs To create awareness about potential of IC Reporting amongst investors and analysts
4. Apply IC Reporting as a tool for government agencies	<ul style="list-style-type: none"> European Commission Member States 	<ul style="list-style-type: none"> To set the right example To improve the management of government agencies
5. Commence further research (from the very beginning, impact should be analysed after 2 years) : e.g. research on new business models dynamics and the importance of IC; research on IC for nations, regions, cities and other emerging communities	<ul style="list-style-type: none"> European Commission Universities and business schools Applied science researchers 	<ul style="list-style-type: none"> To facilitate the learning from using IC Reporting in practice To develop an understanding of the systemic drivers of the IC development To spread practices systematically To develop a systematic knowledge base To test IC Reporting To find a scientific legitimate base for investments in IC (R&D) To support future managers to understand to importance and the handling of IC
6. Set up an International Standardization Steering Group to facilitate the development of consensus-based standardization of taxonomies, indicators, and IC statements for research-intensive SMEs and help develop XBRL standards	<ul style="list-style-type: none"> European Commission, preferably together with OECD, USA, and Japan Business associations Professional associations Accounting bodies XBRL system governing bodies 	<ul style="list-style-type: none"> To initiate that the standards on IC Reporting be developed by organisations that represent different stakeholders as well as the users of IC reports Contacting the XBRL system governing bodies with the aim of developing a prototype for IC items
7. Encourage the Banks to develop new forms of finance for research based SME's	<ul style="list-style-type: none"> EU Finance Ministers possibly in conjunction with the EIB Banks Regulatory Bodies 	<ul style="list-style-type: none"> Lending by Banks based on small margins over cost of funds does not allow the Banks to provide support for any but the least risky needs of research intensive SME's. Examples of good practice of innovative lending amongst the banks and need to be identified, highlighted and disseminated. Encouraging banks to focus on IC will help the banks to better align what they do to assist wealth creation amongst research intensive SME's. It will also send a powerful message to research intensive SME's who are seeking support from banks, by requiring a credible plan for value creation through which the importance and relevance of IC is properly explained.

5.1 Establish an European Adoption Task Force

The Expert Group suggests that this coordinated effort is supported by a European Adoption Task Force whose task is to oversee, catalyse and speed up the development of IC Reporting and management in research-intensive SMEs. The Task Force can help individual countries to adopt IC Reporting guidelines and facilitate mutual learning between Member States on prototyping experiments. The Task Force ensures that momentum is maintained and further ambitions for IC Reporting are being developed towards proliferation and convergence of IC Reporting guidelines. Its composition should be made not only of experts, but especially of members of policy-making bodies (from both European and national level), research institutions, statistical offices – including Eurostat, OECD, UN –, and other relevant stakeholders (firm employers' representatives, investors, financial analysts, accounting standard setters, etc.). In particular, in order to ensure a consistency in the approach, the Task Force should draw on resources of a number of internal Commission services (not only DG Research), as well as representatives of (and not only experts from) relevant competent bodies and external stakeholders.

Member States could mandate the European Commission to play a key role in the organisation of the Task Force. Such key role would be to:

- facilitate the participation of all interested stakeholders;
- help finance focussed research on the measurement and disclosure of intangibles; and
- encourage the development of voluntary guidelines and reporting systems.

The Task Force should work on three work packages simultaneously (see figure 15). Each task is further outlined below.

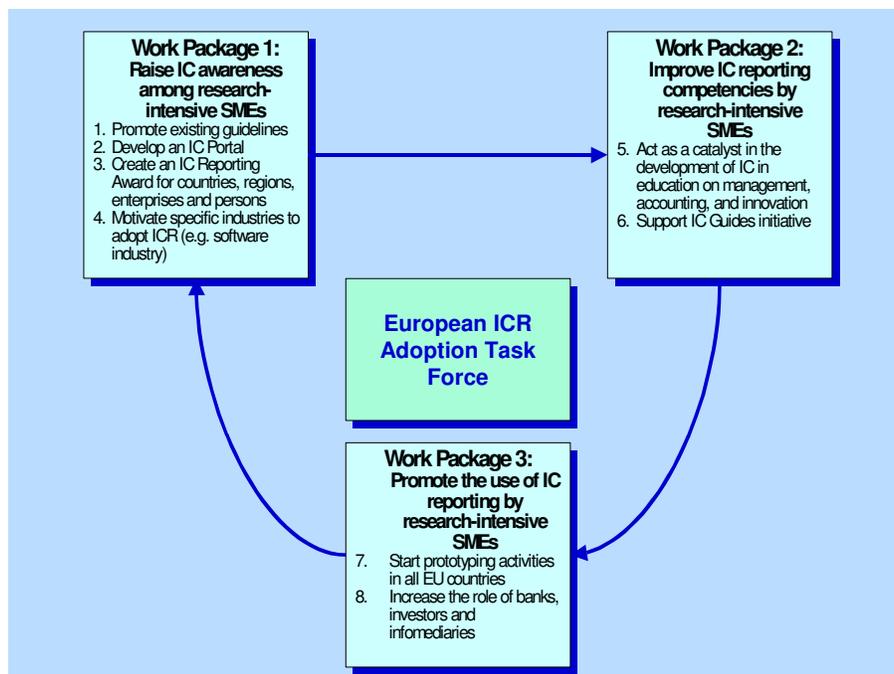


Figure 15: Work Packages of the European Adoption Task Force

5.1.1 Promote existing guidelines and increase awareness

Europe still has a lead in the development and adoption of IC Reporting, however, other countries, and especially Japan and Australia, are rapidly increasing their efforts to develop, standardize and implement guidelines for IC Reporting. The existing guidelines for IC Reporting available in Europe can be used to promote and stimulate the adoption of IC Reporting by research-intensive SMEs and create quick-wins. The Expert Group suggests that the Adoption Task Force actively promotes the use of these guidelines through networking activities with the appropriate business associations and the European Commission actively promotes the use of these guidelines in its communications. Actions to increase awareness among research-intensive SMEs about the importance of IC management and reporting should be taken in conjunction with awareness actions that follow from the 3% action plan (SEC[2003]489).

5.1.2 Develop an IC portal as online Dialog Forum

The Expert Group suggests the Task Force initiates the creation of a special web site for enterprises with an interest to prototype IC statements on their own. It might have some similarities to the Knowledge Board portal or similar open source sites like “Doctors dialogue” in Sweden and Finland (see www.ebc.se). The purpose is to improve IC awareness as well as to offer just in time knowledge sharing of emerging IC Reporting practice. Enterprises can find existing guidelines, emerging information on projects related to IC Reporting, and answers to frequently asked questions.

This knowledge dialogue forum online could later on evolve into a comparative and ‘benchlearning’ tool for transparent reporting on IC indicators. As there are several very informative, as well as well visited IC websites on intellectual capital – among others www.intellectualcapital.nl – the IC portal should focus especially on the emerging practices of the reporting of IC and become a basis for knowledge alliances. It should include ‘IC quizzics’, i.e. specially designed questions that help to refine the IC logic and IC pedagogics. It could be a ‘fill in’ concept that helps users to get a calculated idea of their IC by filling in a number of questions, and that produces an IC report. It should address not only managers but also other special target groups, e.g. auditors, financial analysts, policy makers and academics.

5.1.3 Create a Global IC Reporting Award

One way of stimulating the use of IC in the business community is to increase the visibility of IC Reporting by organizing an IC award on a global scale with national and regional IC Reporting award winners.

The Expert Group suggests that this could be organised in a similar way to the EU Contest for Young Scientists¹⁴, as follows:

- Per country (willing to participate) a local jury of experts (specialists involved in one way or another with IC – academic and business people) plus some international gurus, will judge the efforts of individuals, academic teams, companies and governmental organizations in their endeavours to create ways, systems, formulas etc. to calculate and/or report IC. The local prize is both recognition and a sum of money.
- The winner of each country can participate in an international contest. The participants must use the concept they have developed at least 3 years in a row on real life cases (companies or institutions) and the one with the

¹⁴ <http://europa.eu.int/comm/research/youngscientists/code/1-1.htm>

best results will win the international IC award. This could be – in addition to a sum of money – the opportunity to lecture on the experiences in business schools, congresses etc. The results will be published in well-established magazines and on the IC portal.

This kind of effort will encourage research for better IC calculating, measuring and reporting tools and will show to business and public institutions the value of the use of this kind of tools. The publicity about it will close the loop and will spread the understanding of IC in a broader community.

5.1.4 Motivate specific industries

The Adoption Task Force can motivate specific “intangibility industries” such as the software industry through consultation and networking activities to use IC Reporting. Included in those consultations should be developers and vendors of Enterprise Resource Planning (ERP) software, like SAP, to convince them to develop software that can help research-intensive SMEs to generate IC statements. These front-runners can be used as leverage to stimulate adoption.

5.1.5 Act as a catalyst in the development and inclusion IC management and reporting modules into education

From a series of contacts with both business leaders and senior academics at leading universities and business schools across Europe, it is clear that there is a need for both to be encouraged to give greater emphasis to the preparation of their graduate and MBA students in the ‘art’ of IC valuation and reporting. Among the key justifications for this is the perception among business leaders that any serious attempt to build a ‘knowledge based economy’ will require education and training in a new set of managerial tools and skills.

Not only the students of Business, Accounting, Science and Technology but also of the Social Sciences should be ‘exposed’ to the roles of Knowledge Management and IC Reporting as useful internal and external ‘communication and collaboration tools’. In view of the fact that most University graduates will find employment in SMEs, this should be carried out within the context of providing a general understanding, or at least familiarity, with the realities of modern business.

Studies on innovation management and on innovation policy in Europe are sometimes not close enough to the day-to-day reality of companies. The programmes do not usually take into consideration the fields of Knowledge Management and IC analysis and reporting. Accounting and management scholars, those usually involved in IC research and reporting, are not usually involved in teaching innovation policy. Therefore, closer interaction and integration between these two areas, and the scholars active in them, should be encouraged (Canibano, L.; García-Ayuso, M.; Sánchez, P., 2000).

The emphasis should be on learning how to evaluate the needs of organisations and the demands of their stakeholders, rather than a mechanical ability to apply one of the existing IC Reporting models. Such learning should be in a positive environment, similar to that involved with student’s acquisition of advanced ICT skills.

This recommendation supplements the proposed actions in the 3% action plan (SEC[2003]489) to support EU-wide coordinated IPR and R&D awareness and training activities and to ensure that before graduating, every student – especially from science, engineering and business schools – receives basic awareness/training regarding intellectual property and technology transfer. The Adoption Task Force should oversee that Intellectual property awareness and training activities proposed by the Commission (SEC[2003]489) be complemented with basic awareness/

training regarding IC management and reporting to ensure that students receive basic awareness/ training regarding IC management and reporting.

5.1.6 Support IC Guides initiative

Management tools, such as IC Reporting and quality certification, require a firm engagement on the part of the company's management to implement them in the enterprise. The first step to achieve such commitment is to acquire the necessary knowledge and skills. Although several different models for IC Reporting already exist and some offer easy forms or check lists that can be completed by company staff, the real participation of company managerial staff will only be achieved by training, mentoring and coaching of the Senior Management. The process need not be expensive or time-consuming, but just straightforward, clear and concise, allowing managers to interpret and translate the enterprise's IC into a knowledge narrative and IC indicators. Further involvement of an important part of the personnel of the enterprise is an important second step for success.

The Expert Group suggests that the Adoption Task Force initiates the establishing of a network of business coaches ('IC Guides') that can help research-intensive SMEs in implementing IC Reporting, together with governments of Member States and business associations.

5.1.7 Establish prototyping activities in all EU countries

The level of adoption of IC Reporting among European countries varies considerably. The widespread use of IC Reporting in countries like Denmark, Sweden and Germany is largely due to concerted efforts by local governments in the form of prototyping programs. The Expert Group suggests that these programs are continued in all EU countries, specifically aimed at research-intensive SMEs, and coordinated by the Adoption Task Force.

Elements of the policy mix in every country should include: the installation of a government supported task force to guide the local translation and adoption; the involvement of professional bodies; the initiation of pilot actions and initiatives to promote the concept of IC Reporting by means of conferences, road shows, training courses etc. In Spain, a very effective approach was taken to implement ISO 9001, through conferences, courses and finally with a grant for the final implementation within companies. This could be an example to follow to promote IC Management and Reporting.

Countries with no tradition in IC Reporting should review the existing guidelines (see appendix G) to identify the approach that will suit the needs and culture of their business environment and use that guideline for their prototyping activities. Countries that do have a tradition in IC Reporting should continue and increase their support for the wider proliferation of the dominant guideline.

The prototyping activities will help to propagate the use of IC Reporting and raise awareness. Experiences in Denmark have shown that government involvement helps to add credibility and trustworthiness to the initiative and to share best practices among participating enterprises. It is also useful to select a public or private body that can act as driving force behind the prototyping activities. In Denmark the Copenhagen Business School has been very instrumental in this respect.

This action can possibly be supported by the new OMC-net. OMC-NET is an initiative to support through calls for proposals initiatives undertaken by several countries and regions, involving where appropriate other stakeholders. Selected actions will:

- contribute to more effective national policies through enhanced mutual learning, peer review and identification of good practice;
- identify issues with a strong trans-national dimension, which would benefit from concerted or mutually reinforcing actions at national and EU levels;
- prepare the grounds for concerted actions that interested Member States may launch and for Community legislation or guidelines where appropriate.

5.1.8 Increase the role of investors and infomediaries

The investors' request for information is growing, especially in regard to intangibles. This increasing demand is essentially the result of the need felt by operators to try to understand the real value of a company; which is only marginally based on material or financial assets. Due to this increasing demand for information, investors and infomediaries could be a decisive force in promoting the disclosure of relevant IC information. The Expert Group suggests that investors and infomediaries start to promote an extension of the degree of mandatory reporting requirements on IC, so as to reduce the current information asymmetry about the real company 'value drivers'.

Recently this idea was endorsed at the OECD-University of Ferrara Conference (20-22 October 2005) by the Chairman of the European Federation of Financial Analysts Societies (EFFAS), Mr. Fritz H. Rau, has publicly declared that his Association is willing to look into IC Statements in order to consider its recommendation to the various national Associations of financial analysts in Europe. In particular, he said:

“Corporate valuation is a process that requires both quantitative and qualitative elements, combined with a large degree of knowledge and judgement. As such, information on Intellectual Capital plays an important role in shaping analysts' conclusions. There is a growing demand for Intellectual Capital disclosure on the corporate side. Investment professionals and their associations as users support this approach and may play an important role in defining the information needed for an effective analysis, thus raising the awareness of the importance of Intellectual Capital Reporting in the financial community. EFFAS supports the growing attention and commitment of its member societies towards Intellectual Capital reporting, which is an issue of the greatest importance for investment professionals.”;

Furthermore, the IASB has just issued a draft discussion paper on “Management Commentary” (comments due by April 2006), where it is envisaged that companies have to produce a focussed disclosure on key resources, risks, relationships, and firm's strategy, showing also performance measures and indicators. It is understood that many of this information should address basic company intangibles. Therefore, the trend seems to be pointing to the direction that eventually information on IC to some extent should be made mandatory.

In addition to the extension of mandatory requirements in this field, voluntary reporting and disclosure of IC, with all of its upsides (transparency) and downsides (heterogeneity), should also be encouraged by investors and infomediaries. In this respect, a certain degree of tension should be induced between users and producers of IC statements, so as to favour the development of the quality of such disclosures. Progress in IC disclosure may only be achieved by clearly aligning the interests of the company, which is asked to provide a higher quantity of better quality information to the outside world (with the associated costs), and the analyst, who will use this information within his valorisation framework.

The virtuous circle that we hope to see is one whereby the enterprise first of all becomes used to managing and measuring its intangible value drivers; it subsequently raises its visibility by reporting such drivers to the market, thereby triggering a greater valuation in respect of competitors; this will reduce the cost incurred by the enterprise to access capital, encouraging and justifying further efforts in terms of communication of and transparency in IC.

The IC information may play an important role in shaping the analyst's judgment: for instance, knowing the quality, the seniority and output of an SMEs R&D personnel may lend credibility to the forecasts of new products that, in turn, become revenue forecasts. Knowing the historical trend of a company's customer satisfaction levels may help analysts to improve the quality of the forecast of future retention rates and, again, revenue forecasts. Moreover, IC Reporting may enhance the visibility of a company's business plan: this in turn would help an investor to make a better assessment of a company's prospects and apply a more appropriate cost of capital in the valuation process.

Therefore, the Adoption Task Force can initiate that an agreement is reached with investors and analysts about the IC information needed to determine and to assess the company's performance. This information should be consistent with, and complementary to, that of the financial reporting imposed by accounting standards. The Adoption Task Force, supported by the Commission can play a catalyst role through networking activities with the risk capital markets, secondary markets, and debt markets. Professional associations may help to develop a higher awareness on IC Reporting issues. For instance, the AIAF, Italian Financial Analysts Association, is giving high attention to these issues within the Italian investment community and has made concrete proposals. Trade associations might do the same. However, we believe that this process should mainly be developed on the corporate side.

In this perspective, it is important that investors and intermediaries manifest their preferences and develop models and proposals on IC Reporting. The AIAF model for evaluating company communication on intangibles provides an interesting example (AIAF, 2002, see appendix H). Another example on a similar vein is the model put forward by the Norwegian Association of Financial Analysts.

5.2 Produce a practical guide on IC Reporting

Extensive literature has been published on the subject of IC Reporting. For most research-intensive SMEs it will be difficult to see the wood from the trees. The Expert Group suggests that the European Commission produces two brochures containing practical guidance on how to engage in IC Reporting. One brochure should be aimed at research-intensive SMEs and the other at investors. Both brochures can be used by member states as a basis for their own promotional activities.

5.3 Use IC Reporting as an important criteria for public support for research-intensive SMEs

Public funds are an important source for financing R&D and innovation by SMEs, especially for young entrepreneurs, start-ups, spin-offs and high-tech SMEs. On average, about 20% of European SMEs use public financial support measures for funding their R&D and innovation activities, whereas this number is higher (about 30%) in the group of innovating SMEs¹⁵.

¹⁵ European Commission (2003): Observatory of European SMEs 2003, no.2, SME and access to finance, Luxembourg.

In the last century research, innovation and technology policy implemented a large number of direct and indirect financial support measures for SMEs on the national and European level. Research promotion funds are established in every European country. Amongst others the support is given by providing direct financial grants, providing loan and equity guarantee schemas, interest subsidy, and non-refundable aid on capital or refunding employees training expenses.

A look at the current process on the allocation of these financial sources for SMEs reveals that SMEs usually have to disclose financial accounts and a plan for the project when they apply for financial support. In general, the decisions are strongly based on technical criteria (technical risk, advancement of idea, etc.), which is often also reflected by the composition of the experts and panels who evaluate the proposals. Market-related, organisational and strategic criteria play a role but are to some extent secondary and information about IC is not given in a structured and systemic way.

Yet, information about IC could contribute to a better decision process with respect to allocating public research grants and as well as support the general diffusion of IC management and reporting. Through gathering data about the IC potential of SMEs the funding agencies will receive higher quality information about the firms they support and therefore be better placed to improve their targeted research and innovation policy.

However, the additional demand for IC measures should not imply an extra bureaucratic burden when applying for research funds. A couple of easy to answer questions, such as how a firm is managing its IC, how it develops and protects its competence base, what the complementary assets are, how it is protecting its ideas and technologies (IPR), etc. could be integrated within the process. Asking these questions (on a rather informal basis) might have a positive impact SMEs to start thinking more thoroughly about the subject. Thus, additional information should be based on easy to supply indicators, questions to tick upon and open questions, which set incentives to think about specific subjects and enables learning. A stronger incorporation of IC related activities would thus have a big leverage effect.

These additional criteria for considering IC activities by SMEs could be implemented in the evaluation process of allocating national research funds and innovation measures but could also be implemented for European initiatives such as Framework Programmes. European funding mechanisms and financing institutions should take the lead and act as first mover in this field. Moreover, considering criteria about IC might also be of interest for intermediaries such as technology rating agencies, Innovation Relay Centres, etc. who are involved in funding processes.

5.4 Apply IC Reporting as a tool for government agencies and Higher Education Institutions

When it comes to encouraging IC Reporting the Expert Group recommends that government agencies set an example by reporting their own IC. As is the case with a commercial organisation, all government agencies need to seek ways to become more cost-effective and efficient in the way they use the resources at their disposal and deliver their services to customers and stakeholders. IC Reports could be used to communicate:

1. The outcomes they are seeking in terms of Social, Technological, Environmental, Economic, Political and Legislative (STEEPL) environments;
2. A review of current and intended activities, associated targets and justification for intervention;
3. The resources at their disposal and an explanation of where their strengths & weaknesses lie;
4. The challenges they face and the gaps in resources & capabilities that need to be filled;
5. The ways in which their activities actually create value – Delivery of desired outcomes;
6. The reasons for Metrics and Key Performance Indicators selected to track performance & influence behaviours;

For agencies whose activities directly influence public spending on R&D or support for knowledge intensive SMEs, IC Reports should serve to clarify public policy and thereby justify interventions:

External:

- Highlighting incentives (grants & other schemes) aimed at delivering specific outcomes;
- Explaining the reasons for policy trade offs being made in respect of conflicting (STEEPL) priorities;
- Providing transparency and a basis for dialogue particularly with regard to regulation and red tape.

Internal:

- Providing a basis for benchmarking performance between agencies to highlight best practice, improve efficiency, reduce mistakes and thereby maximise resources for core priorities;
- Provide a basis for staff development and learning to develop the skills and competencies needed to deliver plans for the future;
- Provide a basis for adoption of a more robust system of management information, particularly financial management to support a lean and fit public sector.

European Higher Education Institutions (HEIs) are going through a period of important transformations ('Bologna Process' and the proposed 'European Higher Education Area'). HEI's are now also worried about what has been called Universities' third mission; which includes the relationships between the university and its non-academic partners: industry, public authorities and the general public. In this new context, IC Reporting could improve both the transparency in governance and in their resource management. This could make a valuable contribution to their competitiveness and attractiveness to the most 'forward looking' students and academics of the European Higher Education System.

The Expert Group recommends that Academia (especially universities with strong research programmes) and targeted research organisations (such as the Fraunhofer, TNO, MPIs and the CSIC institutes in the fields of applied and 'nearly ready to be applied research') are encouraged to participate in the efforts to develop IC Reporting cultures & strategies. Universities, Research Institutes, and all similar organisations, should be assisted to see the advantages, both for their internal management and for their relations with society, of developing a more transparent culture and of adopting some of the IC Reporting techniques. Funding agencies

should open lines of communication with HEIs and RTOs on ways to incorporate IC Reporting requirements, but doing so only in an environment of increased support and funding and not as tool for 'cutting back' or 'budget restriction'.

Universities outside of Austria (& RTOs in general) should pay close attention to the evolution of the experience there, where public HEIs will be required by law to report on their targets and achievements as part of a contract linked to part of their public funding from 2006 (see appendix C).

It is important to ensure transparency between the guidelines adopted in the three sectors: industry, RTOs and Universities. Just as the incorporation of some IC indicators in the XBRL system (see recommendation 6) will contribute to this among the companies that implement it, it has also been proposed that an equivalent be developed for HEIs and RTOs: eXtended Academic Reporting Language (XARL). DG Research could promote this by incorporating such a system in the reports required from Integrated Projects and Networks of Excellence. However, care should be taken that XARL does not end up in the separation of 'for profit' and 'not for profit' knowledge industries.

5.5 Commence further research on IC Reporting

During the years since the very first prototype on IC Reporting by Skandia in the early 1990's, considerable development has been in progress on a global scale. In this Report major parts of the latest developments in Europe are captured. More research and prototyping are in progress in Japan, USA, Australia, and China and will later on impact the policy developments for EU.

The Expert Group suggests that further development and improvements on special aspects of IC Reporting should be initiated by the Commission:

- IC Reporting and auditing;
- IC Reporting in the public sector;
- IC Reporting of the intangible wealth of communities, cities, regions and nations;
- IC Reporting and its connections to Financial Capital and especially Value adding;
- IC Reporting and its linkage to Eurostat;
- IC Reporting and forecasting of IC, also called IC mapping;
- IC Reporting and linkage to organizational risk and liabilities;
- IC Reporting and intelligent reward systems;
- IC Reporting and neuroscience & brain research.

IC Reporting research has evolved from reporting on **what** intangibles to visualize (Human Capital, Relational Capital and Organizational Capital), into the **why** of IC Reporting. A process view of IC Reporting has been developed in combination with quantitative measurement methods for IC to measure the effectiveness and efficiency of IC. The next step in the research might be to develop quantitative dimensions for IC Forecasting. One such early prototyping is IC Mapping as a tool for project investment that is being developed by the Swedish Agency for Innovation System (VINNOVA). This analysing tool offers a patented pedagogical landscape of IC drivers affecting total capital growth for investment proposals and project stocks. This prototype needs however more application testing.

5.6 Set up a Standardization Steering Group for IC Reporting

The standardisation of the intellectual capital reporting is at the same time an important and delicate issue. It is important – especially in a policy perspective – because the standardisation of this reporting will help towards providing comparability and interpretability of information on intellectual capital publicly released by private and public sector organisations. In turn, this will attribute both more credibility to the contents of this document and transparency to the reporting entity, hence facilitating the diffusion of ICR. Indeed, at a more careful look one can observe that the lack of standardisation of this report limits the full range of benefits an organisation can draw from it.

However, standardisation is also a delicate issue, because ICR is a tool that should be essentially designed around the specific features of each organisation and its activity. Therefore, the standardisation of ICR cannot be too extreme. The diverse contents of IC Statements are consistent with the fact that entities operate in dissimilar sectors.

In principle, standardisation can focus on the concepts of the various intangible resources (taxonomy), the structure of the IC reports, and the indicators composing this document. Other forms of standardisation have to do with software and information systems. Each level of standardization is described in more detail below.

Taxonomy

As to the standardisation of concepts, it is important to point out that a taxonomy of intangibles is becoming urgent so to avoid the proliferation of words without a precise anchorage. It is also relevant to stress that this exercise would be useful in order to stimulate companies to report on R&D and other innovation related activities. In the very same way as R&D and innovation concepts of Frascati and Oslo Manuals on research and innovation are nurturing IC reports, IC concepts should be taken into consideration in the R&D and innovation questionnaires companies are used to receive and fill in.

The construction of an agreed taxonomy of intangibles and IC elements would be useful not only in order to enhance common understanding and comparison, but also to communicate information on these resources in an electronic format through the eXtensible Business Reporting Language (XBRL). This language, which derives from the XML, would use the intangibles taxonomy created as a basis for the identification of a set of tags aimed to identify all the intangibles and IC elements in a univocal and internationally-shared way (see also below).

Structure of the IC report

On this point there seems indeed to be a quite good convergence on a model of IC report for external purposes which is generally composed of three main, diverse but related sections, i.e. Human Capital, Organisational (or Structural) Capital, and Relational (or Customer) Capital.

This model appears to be already widely adopted by companies and other organisations, and de facto it imposes itself as the form of standardised ICR structure at an international level. Of course, this does not prevent organisations from searching for other ICR structures that can better fit with their internal or ad hoc knowledge and management purposes.

Indicators

As to indicators, standardisation should deal with the identification of such indicators, their precise definition, and their calculation procedure.

The Expert Group believes that standardisation of the indicators composing ICR should be framed in a three level model (see figure 16):

- basic set of indicators;
- sector-specific indicators;
- organisation-specific indicators.

The standardisation effort should be especially directed at the first level, with the aim of defining a generally agreed minimal set of common indicators, which could be published by companies and other organisations. These indicators should be clearly identified, defined, and described also in their determination process. In other terms, this effort should delineate a few relevant indicators, which can be calculated,

used and published – ideally – by all organisations in a comparable way (e.g. some indicators regarding the human capital, and/or the organisational capital). The choice of these micro indicators (i.e. at the level of the individual company/organisation) on intangibles should be as much as possible consistent with the knowledge and data needs of the statistical offices at the macroeconomic level for policy formulation.

The process of ICR standardisation could also cope with the above defined second level. In this respect, ad hoc bodies should operate at the industry level in order to single out a few appropriate indicators according to the specific characteristics of the sector.

At the third level the Expert Group does not envisage any standardising effort, so to leave the individual organisation free to identify, define and calculate the indicators which it reckons best for its particular characteristics, activities, key value drivers, and so on. In this case the Expert Group recommends, though, that each organisation discloses the definition and the determination procedure used for these specific indicators.

In a nutshell, the idea would be to encourage a standardisation to be reached through consensus, and that resembles to a reverse pyramid, in the sense that at the general level the extent of the standardisation should be minimal, while at the sector level the extent of this process should be larger in order to have IC reports that are consistent with industry characteristics. At the third level, companies and other organisations should be left to choose the most appropriate specific indicators, with a commitment, though, of revealing their definitions and calculative procedures.

Standardisation of ICR is not an easy process, and certainly it will require some time to be achieved also in its minimal terms. The emergence of a generally agreed set of common indicators should find its roots in the best practices and experimentation of companies and other organisations which have started using this reporting tool.

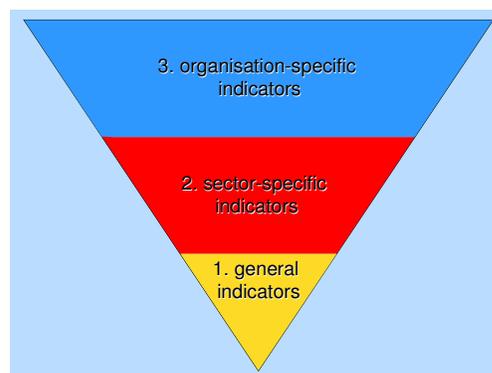


Figure 16: Different levels of indicators

Software & information systems

The standardisation of the software and information systems relating to the IC elements and report is another form through which a good amount of convergence in the ICR models can be quite rapidly achieved. Evidently, this is an indirect form of standardisation of ICR.

The data that companies *can* collect and disclose is heavily dependent on the functionality of the information system that is used by companies themselves. The providers of software for management information systems and financial reporting should be encouraged to create products, applications and systems which can collect data on the full spectrum of company intangibles, and which can structure and disclose this data in a potentially comparable, if not standardised, way. This calls for an agreement to be reached among the main software and information systems producers about a minimum level of standardisation in this area.

In this perspective, a particular evolution which is strongly envisaged by the Expert Group – and that has already been mentioned – is the rapid construction of a taxonomy of intangibles that can be employed for the electronic exchange of financial and non-financial information on intangibles through XBRL. The set of identifying XBRL tags could be easily be incorporated into any of the existing software and information systems due to the interoperability feature of this electronic language.

Steering Group

Another delicate issue in this subject area is the actors that should be in charge of this ICR standardisation process. The Expert Group believes that this effort cannot be carried out but primarily by the organisations that represent different stakeholders as well as the users of IC reports (employers, banks, accounting firms, managers, stock exchange agencies, trade unions, and alike).

Another important element to consider is that to reach the above convergence, it is also necessary that scholars from accounting and management field work hand in hand with scholars from innovation and research studies in whatever institutions be created to stimulate IC reporting though standardisation.

On a similar vein as pointed out by a 2003 study on the measurement of intangible assets prepared for the European Commission (Zambon, 2003), and in order to ensure consistency in the standardisation approach, the Expert Group believes that this effort should be centred around a dedicated international Steering Group made up of representatives of (and not only experts from) relevant competent bodies and external stakeholders. The European Commission could act as a catalyser of this exercise, favouring the presence of the appropriate organisations. A related aspect is to decide whether this proposed Steering Group should also be enlarged to encompass representatives from institutions and bodies of non-European countries (e.g., Japan, USA and OECD).

More in detail, one of the main aims of this Steering Group would be to develop a more comprehensive series of microeconomic indicators of economic performance, so as to, in the longer term, set standards for the reporting on intangibles by firms. As pointed out above, its composition should be made not only of experts, but especially of representatives of policy-making bodies (from both European and national level), research institutions, statistical offices and other relevant stakeholders (firm employers' representatives, investors, financial analysts, accounting standard setters, etc.).

The Steering Group should also:

- develop consistent rules or guidelines for assigning value to some non-traded assets (e.g. reputational or social capital);
- research on how intangible and tangible assets interact to create company and social value;
- favour further experimentation in the field by companies and public sector bodies; and
- collect information on company and social intangibles, supplied by the various stakeholders, using harmonised criteria and on a European basis, in order to set up a specific and unitary database working on a networked architecture.

The Steering Group should operate through the dialogue by inviting the different national and stakeholder groups to express their interests and proposals also in public hearings. In particular, as aforementioned, a useful move would be to involve software and information systems producers since the early stage, so to ensure that the standardisation potential created could be translated in full operational action.

The Expert Group wishes to stress the importance of addressing a certain amount of the standardisation activity on the calculation/determination process of the identified IC indicators, since this will help the development and the consolidation of the today's much needed ICR audit/attestation practices and procedures.

This here prospected Steering Group would not start from scratch. As pointed out above, even though we still lack a standardised content of ICR, there is indeed a convergence on the general model of IC report for external purposes, which is made up of three different but related sections, i.e. Human Capital, Organisational Capital, and Relational Capital. Moreover, there are a certain number of Guidelines for the preparation of IC reports (see appendix G) that can serve to the Steering Group as a useful starting point for the standardisation process here addressed.

The Eliop case study (see appendix H) shows how important the standardization process can be for some companies.

XBRL standards for IC

eXtensible Business Reporting Language is a well-known electronic language for the communication of business and financial data. It is an open standard, free of licence fees, already implemented in a number of countries. The idea behind the system is that instead of treating business information as a block of text, the language provides an identifying tag for each individual item of data, which is computer readable. Computers can thus treat XBRL data "intelligently". They can recognize the information in a XBRL document, select, analyse, store and exchange it with other computers and present it in a variety of ways. Not only does the system increase the speed of handling the data, but also it reduces the chance of error and permits the checking of information.

XBRL potential beneficiaries are all those who collect or use business data and those who produce it, such as policy makers in general, regulators, economic agencies, stock exchanges, financial information companies, researchers, accountants, auditors, managers, financial analysts, investors and creditors and last but not least the information technology industry.

The different governing bodies within the organization have among their objectives developing taxonomies, which are the dictionaries that the language uses. They are the categorisation schemes that define the specific tags for individual items of data. Having in mind that different countries have different accounting regulations and that

different industries, or even companies, may have specific accounting requirements, there may be specific taxonomies to cover specific business reporting needs.

A long list of intangibles is already included in the latest published taxonomy (last version January 2005), but it includes only the Intangible Assets accepted as such by the IASB. There is nothing done yet about the rest of the IC items.

Having in mind the potential benefits resulting from an XBRL taxonomy of some IC items, the Expert Group suggest that the Standardization Steering Group works with the XBRL system governing bodies with the aim of developing a prototype for IC items. Two immediate candidates to be part of the taxonomy would be R&D expenses and Innovative expenses. They would both be based on the glossary of this Report and therefore on the OECD definitions. Thus, they would tackle concepts with which companies are already familiar when filling the questionnaires for the R&D and the Innovation Surveys. The definitions adopted would be independent from the national accounting regulations and therefore would provide world wide comparable figures, which would therefore be useful for developing and monitoring R&D and innovation policies.

5.7 Encourage the Banks to develop new forms of finance

Banks should be encouraged to embrace innovation themselves by developing new forms of finance which better meet the needs of Research Intensive SME's

By its very nature, bank lending is only suitable to propositions, which carry very low risk. This is because the bank only has its lending margin, over and above the cost of funds (costs associated with attracting deposits - interest payments etc. – in other words its net interest income), to cover the costs of appraising and monitoring loans, covering losses arising from bad debts and providing an acceptable return to shareholders. To put this in perspective lending at 4% above its cost of funds would mean zero profit if one in twenty five borrowers failed to repay. In other words the bank needs to get its lending decisions right more than 96% of the time to make any money from lending.

Notwithstanding the level of risk that banks are willing to accept with regard to lending, the majority of research-intensive SMEs see banks as their primary source of funds. (It should also be noted that some banks also provide equity, sometimes packaged with lending, sometimes as a distinctive business area).

Possible options for new forms of finance in meeting the needs of research-intensive SMEs for Banks might include high interest loans, loans with higher up front fees which enable more detailed appraisal of lending propositions or low interest lending with some way of sharing in value created should the venture succeed. Taking an equity stake or being provided with an equity option would better align the interests of the bank with those of the entrepreneur but this also means that the banks would have to take account of more strategic and operational issues than they are used to doing. IC statements would help the banks with this process.

EU Finance Ministers have in the past made recommendations that the EIB makes available more of its surplus capital to assist SME's. We would like to see this issue revisited by the Finance Ministers with the specific aim of encouraging the Banking Community within Member States to take a more proactive and innovative stance in the way in which they provide support to research intensive SME's.

Appendix A. High Level Expert Group

Name expert and contact details	Photo	Name expert and contact details	Photo
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Appendix B. Names of Guests of Workshops June 2005

- . Mr. Adrian Curaj
- . Dr Frank Heemskerk
- . Dr. Bo Heiden
- . Dr. Rolf Hochreiter
- . Mr. Helmut Mader
- . Mr. Guido Pfeifer
- . Mr. Amiram Porath
- . Mr. Grégoire Postel-Vinay
- . Mr. Olivier Protard
- . Mr. Franz Reinisch
- . Mr. Stephen Riediger
- . Dr. Hanno Roberts
- . Mrs. Karen De Ruijter
- . Prof. Lars Terenius
- . Mrs. Asta Thorleifsdottir
- . Mr. Giampaolo Trasi
- . Mr. Peter Wright

Appendix C. Austrian Universities Act 2002

Austrian Universities Act 2002

Sub-chapter 2

Finance, performance agreement and quality assurance

Federal funding

12. (1) The universities shall be funded by the Federal Government, having regard to its financial resources, the requirements imposed by it on the universities and the performance of their duties.

(2) Pursuant to section 13, the Minister shall, not later than the end of the second year of each performance agreement period, establish a global amount for university funding in the next performance agreement period in consultation with the Minister of Finance, and shall reach agreement thereto in accordance with section 45 Federal Budget Act, BGBl. No. 213/1986.

(3) This amount shall, in accordance with the arrangements set out in subsection 2, be increased by that of the universities' expenditure incurred as a result of general salary increases payable in individual years of the current performance agreement period to federal employees present at universities on the day before the entry of this Act into full effect, insofar as such staff are employed by universities or the Federal Government, or assigned to universities under special contracts or training contracts with the Federal Government during the periods in question. Such increases may not exceed the percentage by which the Federal Government's budgeted personnel expenses exceed the budget for the previous calendar year.

(4) The increase under subsection 3 shall be limited to the amount that would be required if the university personnel subject to this provision still had employment, training or special contracts with the Federal Government.

(5) The Minister may retain up to one percent of the annual budget under subsections 2 and 3 for special funding requirements in respect of supplementary performance agreements under section 13.

(6) The overall budget under subsections 2 and 3 shall be subdivided into a component devoted to the basic budget under section 13 and a component for the formula-based budgets under subsection 8.

(7) Each university shall receive a global budget, established in advance for the three-year period. This shall consist of its basic budget and formula-based budget. The universities shall be free, within the limits of their duties and the performance agreements, to dispose of their global budgets as they see fit. No reduction in a university's global budget may exceed two percent of the global budget established for the previous three-year period during the first year of a three-year period, four percent in the second and six percent in the third.

(8) The formula-based component shall amount to 20 percent of the global budget under subsections 2 and 3. The amounts apportioned to individual universities shall be calculated in accordance with qualitative and quantitative indicators. The latter shall relate to teaching, research, the advancement and appreciation of the arts, and social goals.

(9) The Minister shall, by order, in consultation with the Minister of Finance, and after consultation of the universities, establish the performance indicators under subsection 8 and the method of calculation of the formula-based budgets by 31 December 2005.

(10) The universities shall report their receipts from third-party funds and investment income. These shall remain at the disposal of the universities and shall not reduce state allocations.

(11) Resources shall be allocated monthly, on a pro rata basis. Universities' monthly allocations may, within the limits of the global budgets available to them, be adapted to their requirements.

Performance agreement

13. (1) Performance agreements are contracts in public law. They shall be concluded by the several universities and the Federal Government, within the limits of the law, for periods of three years.

(2) Performance agreements shall, in particular, contain:

1. the services to be provided by the university in question, which shall, in accordance with the objectives, principles and duties of such university, cover the following areas:
 - (a) strategic objectives, academic priorities, and university and human resources development:
The long-term objectives and those to be attained within the term of the performance agreement shall be specified. The university shall set out its special priorities and strengths, and the resources allocated to the attainment of the objectives derived therefrom. It shall also state which human resources development measures and incentives are required in order to attain the objectives, and what contributions the university's members are to make thereto.
 - (b) research, and the advancement and appreciation of the arts: The university shall, in particular, disclose its planned research projects and programmes, and those to be continued during the period in question, as well as its projects for the advancement and appreciation of the arts.
 - (c) study programmes and continuing education: The information on degree programmes and continuing education activities shall be supported by appropriate statistics relating to quantitative trends in these areas and by the results of analysis of student course evaluations, broken down by degree programmes. The university shall set out its plans for its degree and continuing education programmes, and for the training of particularly able doctoral and postgraduate students on this basis, and shall specify any changes in the organisation of teaching and study aimed at aligning it to the target competency profiles of students and research staff.
 - (d) social goals: The universities shall formulate their contribution to social progress. This includes measures to increase the proportion of senior positions held by women, courses for working students, the expansion of the socially relevant areas of cultural and research programmes, and knowledge and technology transfers.
 - (e) increased internationalism and mobility: Activities and projects in this area relate, in particular, to multi-year international co-operation agreements with other universities, research and cultural institutions, to joint degree programmes and exchange programmes for students, academic and art staff, and to increasing the proportion of foreign undergraduates and postgraduates in the student body.

(f) inter-university co-operation: The universities shall give an account of their efforts to promote the common use of organisational units and services with other universities. This shall include information on the areas, extent and effects of co-operation with other Austrian universities.

2. Commitments made by the Federal Government: allocation of the basic budget, taking into account the criteria therefor,
3. the content, extent and scope of the objectives and the timing of goal attainment;
4. the division of the basic budget into allocations for given budget years;
5. action in the event of non-fulfilment of performance agreements;
6. reporting and accounting.

(3) Performance agreements may be amended in the event of significant changes in the circumstances on which they are based.

(4) The basic budget shall represent the basic funding determined in the light of the performance agreement. The following categories shall form the basis for the negotiations and shall be the key parameters for calculation of the basic budget:

- a) needs;
- b) demand;
- c) performance;
- d) social goals. These four criteria shall be specified in detail in the performance agreements, having regard to sections 2 and 3.

(5) Universities shall submit performance reports based on the performance agreements to the Minister by 30 April of each year. After the second budget year performance reports shall, further, contain forecasts of the performance outcomes and the financial situation of the respective university in the third year.

(6) Each university shall submit an intellectual capital report for the past calendar year to the Minister, by way of the university council, by 30 April of each year. This shall, as a minimum, present in itemised form:

1. the university's activities, social goals and self-imposed objectives and strategies;
2. its intellectual capital, broken down into human, structural and relationship capital;
3. the processes set out in the performance agreement, including their outputs and impacts.

The Minister shall, by order, issue regulations for the structure and design of intellectual capital reports.

(7) Universities shall submit drafts for their next performance agreements to the Minister by 30 April of the third year of the term of current performance agreements. The Minister shall respond to such drafts by 31 August. Negotiations on performance agreements shall be concluded by 31 December.

(8) In the event that a performance agreement is not concluded on time, the Minister and the senate of the university in question shall each appoint an appropriately qualified person to an arbitration commission. These two members shall appoint a third without delay. If agreement on the third member is not reached within four weeks then the President of the Austrian Academy of Sciences shall nominate such member. The arbitration commission shall seek to arrive at a performance agreement within six weeks of the appointment of the third member.

(9) If agreement on a performance agreement is not reached within this six-week period the university concerned shall receive basic budgets representing 98 percent of its funding in the first, second and third year of the previous performance agreement until such time as a new agreement is concluded.

Evaluation and quality assurance

14. (1) The universities shall develop their own quality management systems in order to assure quality and the attainment of their performance objectives.

(2) The subject of an evaluation is the university's duties and the entire spectrum of its services.

(3) Evaluations shall be conducted in accordance with subject based international evaluation standards. The areas of university services to be evaluated shall, in the case of evaluations relating to single universities, be established by the respective performance agreement.

(4) The universities shall carry out internal evaluations on an ongoing basis, in accordance with their statutes.

(5) External evaluations shall take place:

1. at the instigation of the university council or rectorate of the university in question or the Minister where they relate to individual universities;
2. at the instigation of the university councils or rectorates of the universities in question or the Minister where more than one university is concerned.

(6) The universities concerned and their governing bodies shall be obliged to provide the necessary data and information for evaluations, and to co-operate.

(7) The performance of university professors, lecturers, and other research, art and teaching staff shall be regularly evaluated, at least once every five years. The detailed arrangements shall be established by university statutes.

(8) The consequences of all evaluations shall be for the decision of the governing bodies of the universities. Performance agreements shall include arrangements for student evaluation of teaching.

(9) The cost of evaluations ordered by the Minister shall be borne by the Federal Government.

Appendix D. Glossary of Terms

Term	Definition	Source
Balanced Scorecard (BSC)	A measurement system that balances financial value and non-financial value. A balanced scorecard is typically divided into a number, usually between three and six, of focus areas that have been identified as critical for the company. The focus areas are populated with indicators that are measured. Suitable for communication around, and visualization of value creation. The term is coined by Robert S. Kaplan and David P. Norton.	Edvinsson, L., Richtner, A. (1999) "Words of value- giving words to IC", Skandia.
Benchmarking	A continuous process of measuring and comparing products, services and processes with those that are "best-in-class"; leads to "best practice".	Edvinsson, L., Richtner, A. (1999) "Words of value- giving words to IC", Skandia.
Best practice	What has generated best outcome in the past	Edvinsson, L., Richtner, A. (1999) "Words of value- giving words to IC", Skandia.
Complementary assets	Anything that is valuable in getting an enterprises products, processes and services to the marketplace, both what exists at the present and what is planned for the future e.g. fruits of innovation including scientific and technological research. There are three types of complementary assets: Generic Assets: General-purpose assets that need not be tailored to the innovation in question Specialised assets: Assets with unilateral dependence Co specialised assets: Assets with bilateral dependence	Teece, D. (2000), Managing Intellectual Capital, Oxford University Press. Oxford
Customer capital	The value of customer base, customer relationships and customer potential. Component of structural capital.	Edvinsson, L., Richtner, A. (1999) "Words of value- giving words to IC", Skandia.
Explicit knowledge	Explicit knowledge is formal and systematic and can be easily communicated and shared, in product specifications, scientific formulas or computer programs (Nonaka). Explicit knowledge is articulated knowledge – the words we speak, the books we read, the reports we write, the data we compile (Hubert Saint-Onge).	Edvinsson, L., Richtner, A. (1999) "Words of value- giving words to IC", Skandia
Hidden value	Value that is not shown in the balance sheet but still contributes to the organization's value creation, for example knowledge. Equivalent to IC. Value not included in market capitalization but inherent in the company's intellectual assets; Intellectual (capital) potential (Leif Edvinsson).	Edvinsson, L., Richtner, A. (1999) "Words of value- giving words to IC", Skandia

Human capital	The accumulated value of investments in employee training, competence, and future. The term focuses on the value of what the individual can produce; human capital thus encompasses individual value in an economic sense (Gary S. Becker). Can be described as the employees' competence, relationship ability and values. Work on human capital often focuses on transforming individual into collective competence and more enduring organizational capital.	Edvinsson, L., Richtner, A. (1999) "Words of value- giving words to IC", Skandia
Indicator	A measurement that visualizes a certain aspect of the organization that has been identified having an impact as a key success factor. Indicators are not to be mixed up with objectives, since indicators have the purpose of indicating a certain development and not to describe a target value.	Edvinsson, L., Richtner, A. (1999) "Words of value- giving words to IC", Skandia
Infomediaries	Middlemen between investors and investees who broker information on investment opportunities	n.a.
Innovation	An innovation is the implementation of a new (for the enterprise, the industry or the world) solution aiming at enhancing its competitive position, its performance, or its know-how. An innovation may be technological or organisational. A technological product (good or service) or process innovation comprises implemented technologically new products and processes and significant technological improvements in any of them. An organizational innovation includes the introduction of significantly changed organisational structures, the implementation of advanced management techniques and the implementation of new or substantially changed corporate strategic orientations.	Based on: OECD/European Commission - Eurostat (1997, 2nd edition) "Proposed guidelines for collecting and interpreting technological innovation data – Oslo Manual, The Measurement of Scientific and Technical Activities." OECD Publications, Paris, France.
Intangible Assets	An identifiable non-monetary asset without physical substance held for use in the production or supply of goods or services, for rental to others, or for administrative purposes.	Based on: International Accounting Standards Committee, 1998, IAS 38 intangible assets. p. 984
Intellectual capital	Intellectual capital is the combination of the human, organizational and relational resources and activities of an organization. It includes the knowledge, skills, experiences and abilities of the employees; the R&D activities, the organizational routines, procedures, systems, databases and intellectual property rights of the company; and all resources linked to the external relationships of the firm, with customers, suppliers, R&D partners, etc. This combination of intangible resources and activities allows an organisation to transform a bundle of material, financial and human resources in a system capable of creating stakeholder value. Intangibles to become part of the intellectual capital of an organisation have to be durably and effectively internalised and/or appropriated by this organisation.	Elaboration from MERITUM (2002), <i>Guidelines for managing and reporting on intangibles</i> (Intellectual Capital Report), Airtel-Vodafone Foundation, Madrid, and Zambon (2000), <i>The strategic connotations of knowledge and intellectual capital: the new drivers of the internal and external company value</i> , presentation delivered at the Business International Conference on "The value of intangible assets", Milan, March
IC Reporting	IC Reporting is the process of creating a story that shows how an enterprise creates value for its customers by using its IC. This involves identifying, measuring, and reporting IC, and constructing a coherent presentation of how the enterprise uses its knowledge resources.	

IC Statement	An IC Statement is a report on the IC of the enterprise that combines numbers with narratives and visualizations, that can have two functions: <ul style="list-style-type: none"> • complement financial management information (internal management function); • complement the financial statement (external reporting function). 	
Intellectual property	Intellectual assets that qualify for legal or commercial protection i.e. patents, trademarks, copyrights, and trade secrets.	Edvinsson, L., Richtner, A. (1999) "Words of value- giving words to IC", Skandia
Intellectual property rights	Protection of intellectual assets such as patents and trademarks.	Edvinsson, L., Richtner, A. (1999) "Words of value- giving words to IC", Skandia
Investors	Public or private organizations and private individuals who invest in new or existing ventures in order to achieve a positive financial outcome	n.a.
Knowledge	Information that has value in the interaction with human capital. The ability people have to use information to solve complex problems and adapt to change. The individual ability to master the unknown. The ability to act (Karl-Erik Sveiby). Knowledge can be classified as explicit or tacit (Nonaka).	Edvinsson, L., Richtner, A. (1999) "Words of value- giving words to IC", Skandia
Knowledge economy	An economy in which knowledge is the most important input factor. The new economic theory for the knowledge economy is – in contrast to the conventional economic theory – developed in and for the knowledge era. It is especially characterized by the law of increasing returns (W. Brian Arthur and Paul Romer).	Edvinsson, L., Richtner, A. (1999) "Words of value- giving words to IC", Skandia
Knowledge innovation SM	Creation, evolution, exchange and application of new ideas into marketable goods and services, leading to success of an enterprise, the vitality of a nation's economy and the advancement of society (service mark owned by Debra M. Amidon, Entovation International).	Edvinsson, L., Richtner, A. (1999) "Words of value- giving words to IC", Skandia
Knowledge Management (KM)	Knowledge management includes managing information (explicit/recorded knowledge); managing processes (embedded knowledge); managing people (tacit knowledge); managing innovation (knowledge conversion); and managing assets (IC) (David Skyrme, Nick Willard).	Edvinsson, L., Richtner, A. (1999) "Words of value- giving words to IC", Skandia
Organizational capital	Systematized and packaged knowledge, plus systems for leveraging the company's innovative strength and value-creating organizational capability.	Edvinsson, L., Richtner, A. (1999) "Words of value- giving words to IC", Skandia
Policy Makers	Civil servants on European, country, region or local level involved with the stimulation of the European knowledge economy	n.a.
Research & Development	Research and development (R&D) comprise creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society, and the use of this stock of knowledge to devise new products or services.	OECD (2002, 6th edition) "Frascati Manual 2002; Proposed Standard Practice for Surveys on Research and Experimental Development." OECD Publications, Paris, France.

Research/innovative intensive SME	High tech SMEs including start-ups. For these SMEs R&D is a core activity. Medium and Low tech SMEs. These SMEs perform R&D or outsource R&D but it is not a core activity. Innovative SMEs who do not perform R&D but who are innovative.	TERSTI (2003), Third European Report on Science & Technology Indicators 2003, DG Research, European Commission.
SMEs¹⁶	Small and medium sized enterprises are enterprises that have between 10 and 249 occupied persons, a turnover of maximum 50 million EURO and a balance-sheet total of maximum 43 million. SMEs can be divided into: Medium-sized enterprises- Medium-sized enterprises have between 50 and 249 occupied persons. The turnover threshold is 50 million and the threshold for the balance-sheet total is 43 million. Small enterprises - Small enterprises have between 10 and 49 occupied persons. The turnover threshold and the balance-sheet total is 10 million.	Commission Recommendation - 2003/361/EC
Structural capital	Customer capital and organizational capital. What is left in the company, when the human capital, the employees, have gone home. The result/value of past IC transformation efficiency/performance. The potential for future IC and financial value creation. The tool(s)/vehicles for human capital relationship value creation: Consists of value-creating and non value creating (value-consuming) components. The sum of intangible assets and intangible liabilities (Leif Edvinsson).	Edvinsson, L., Richtner, A. (1999) "Words of value- giving words to IC", Skandia
Tacit knowledge	Tacit knowledge is highly personal and hard to formalize and communicate. Tacit knowledge consists of know-how and mental models, beliefs and perspectives (Ikujiro Nonaka).	Edvinsson, L., Richtner, A. (1999) "Words of value- giving words to IC", Skandia
Tangible asset	A physical or monetary asset. Often associated with the financial focus area.	Edvinsson, L., Richtner, A. (1999) "Words of value- giving words to IC", Skandia
Value	A measure of people's appreciation of some phenomenon. The value of goods and services can either be measured by the amount of money or other goods or services for which they can be exchanged. Value is what someone wants and is willing to pay to get it.	Edvinsson, L., Richtner, A. (1999) "Words of value- giving words to IC", Skandia
Value creation	Refinement and transformation of human capital, customer capital and organizational capital through mutual collaboration, into financial as well as non-financial value. A direct result of how people generate and apply knowledge.	Edvinsson, L., Richtner, A. (1999) "Words of value- giving words to IC", Skandia

¹⁶ Please note that despite the official definition of the EC regarding SME, the definition varies in the member states.

The target group of this report is broader than official SME definition.

Appendix E. Glossary of Abbreviations and Acronyms

- BSC** - Business Scorecard
- CSIC** - Consejo Superior de Investigaciones Científicas.
- DG** - Directorate General (in the EC)
- DMSTI** - The Danish Ministry of Science, Technology and Innovation
- DTI** – Department of Trade and Industry (UK)
- EC** – European Commission
- EIB** - European Investment Bank
- EIF** - European Investment Fund
- EU** – European Union
- HLEG** – High Level Expert Group
- IAS** – International Accounting Standards
- IC** - Intellectual Capital
- ICS** - Intellectual Capital Statement
- IDA** – Identity Assets
- IT** – Information Technology
- ICT** – Information Communication Technology
- IP** - Intellectual Property
- IPR** – Intellectual Property Rights
- KBE** – Knowledge Based Economy
- KM** - Knowledge Management
- MERITUM** - Measuring Intangible to Understand and Improve Innovation Management
- MIS** - Management Information System
- OECD** - Organization For Economic Co-Operation and Development
- PRISM** - Policy-Making Reporting and Measurement Intangibles Skills Development Management
- R&D** - Research and experimental development
- RTO** - Research Technology Organisation
- SMEs** – Small and Medium-sized Enterprises
- STA** - Scientific and technological activities
- STET** - Scientific and technical education and training
- TG** - Target Group
- TPP** - Technological product & Process
- UNESCO** - United Nations Educational, Scientific and Cultural Organization
- UNIC** – Universal Networking Intellectual Capital

Appendix F. Information on Intangibles by Spanish Companies

The list below summarizes the situation of the companies (mostly big companies) included in the IBEX 35 list (top quoted companies) in the Madrid Stock Exchange. Out of the 35 only 5 of them are actually providing what we would call an IC statement. Nevertheless the quality of the information provided on their intangibles by most of the whole group has improved over the last few years.

Many companies provide some information about their human, structural and relational capital, although they seldom used the term “intellectual capital” to refer to them. It must be said that many companies are obliged to provide reports on Corporate Social Responsibility or similar and it is under the umbrella of this report where they produce information on the above mentioned intangibles. However, a table with a system of indicators showing a full picture of the main intangibles of the company is missing in most of them.

R&D is, in particular, a very elusive figure. It appears on the balance sheet only in those cases where the company has been able to capitalize it, and only for the amount that fulfils certain requirements. The other R&D costs that do not fulfil such requirements must be recognised as expenses in the profit and loss account.

This means that only very expert people, and after a very detail analysis, are able to grasp the real R&D effort made by Spanish firms. The R&D effort is a hidden data.

Name of the company	Industry	Phase	Nº of firms in each phase	Characteristics
FCC	Construction	I		Legal documentation provided. Annual report. Short narrative and very few indicators.
PRISA	Cultural production - Media	I		
TELEFONICA MOVILES	Telecommunications	I		
TELEFONICA PUBLICIDAD E INFORMACION	Publicity	I	4	
ACCIONA	Construction and Real State	II		Legal documentation provided. Annual report. Management Report. Report on Strategy. Business units explained. More developed narrative on human resources. Some more indicators.
ACERINOX	Metallurgy	II		
ALTADIS	Tobacco	II		
AMADEUS	Travel agency and air transport services	II		
CORPORACION MAPFRE	Assurances	II		
ENAGAS	Electrical and gas utilities	II		
NH HOTELES	Hotels	II		
SACYR-VALLEHERMOSO	Construction and Real State	II		
SOGEABLE	Telecommunications	II		
TELECINCO	Cultural production - Media	II	10	
ACS	Construction and Real State	III		Corporate Responsibility Report or Environmental Report provided. Narrative well developed. Indicators on IC provided although not always called that way.
BANCO POPULAR	Financial services	III		
BANESTO	Financial services	III		
GAMESA	Aircraft industry	III		

Name of the company	Industry	Phase	Nº of firms in each phase	Characteristics	
IBERDROLA	Electrical and gas utilities	III			
IBERIA	Air transport	III			
METROVACESA	Construction and Real State	III			
ABERTIS	Real State	III			
BANCO SABADELL	Financial services	III			
ENDESA	Electrical and gas utilities	III			
FERROVIAL	Construction and Real State	III			
INDITEX	Clothes and leather goods	III			
REPSOL	Oil and gas production	III			
BSCH	Financial services	III			
GAS NATURAL	Electrical and gas utilities	III			
INDRA	Computer services	III	16		
ARCELOR	Metallurgy	IV			Annual Report plus Social Corporate Responsibility Report with Section on Intangibles or Intellectual Capital. A well developed narrative. A system of indicators.
BANKINTER	Financial services	IV			
BBVA	Financial services	IV			
TELEFONICA (GRUPO)	Telecommunications	IV			
UNION FENOSA (GRUPO)	Electrical and gas utilities	IV	5		

* In 2003 there were 5 companies in phase I, 13 in phase II, 12 in phase III, and 5 in phase IV

Appendix G. Guidelines, Cases and Tools

1. Danish: Intellectual Capital Statements - The New Guideline

Description

http://www.videnskabsministeriet.dk/fsk/publ/2003/guideline_uk/guideline_uk.pdf

Publisher:

Intellectual Capital Statements - The New Guideline was funded and published by the Danish Ministry of Science, Technology and Innovation. The Intellectual Capital Statement, according to **The Danish Guideline**, consists of four elements, which together express the company's knowledge management:

- Knowledge narrative: A narrative about the firm's ambition to create (use) value for its customers and the types of knowledge resources required to accomplish this;
- Management Challenges: The durable challenges posed by the role of knowledge resources in the firm's business model;
- Efforts: The initiatives to compose, develop and procure knowledge resources;
- Indicators: The mechanisms of monitoring the portfolio, development and effects of knowledge resources.

Case study

Case study 5: Maxon Telecom A/S

<http://www.maxon.dk>

Company profile: Maxon Telecom A/S is a medium sized firm that designs and develops cutting-edge mobile telephones for its Korean parent company, which then manufactures the phones. Maxon Telecom is given the basic specification for mobile phones and takes part in an active dialogue on technical specifications and designs. It provides competent sparring necessary for its Korean parent company to supply 'communication, anytime, everywhere to its customers'.

Case study background and objectives: As a competent sparring partner, Maxon Telecom must be able to compile and exploit the necessary knowledge resources. This can be achieved in many ways and the knowledge narrative that Maxon has drawn up as part of its IC Statement specifies which knowledge resources it considers necessary to create value. Highly skilled employees are particularly important because they own the ability to play with technology and make new technologies work. These employees must also be motivated to become involved in the company's business, as only then will customer needs be met. It requires an understanding of the needs of mobile phone: users, manufacturers and operators. Maxon Telecom is a development house and therefore it has to be at the cutting edge of technology; it requires knowledge of existing as well as future technologies.

Managing innovation in Maxon Telecom through its IC Statement

Maxon Telecom Denmark develops telecommunication equipment. It is an R&D unit of its Korean parent company, Maxon Telecom Ltd. The parent company employs approx. 4000 people worldwide and was, in 2001, the reference year for this case study based on its Danish subsidiary, the world's second largest manufacturer of mobile phones producing 5 million units per year. The company has production facilities in South Korea, the Philippines and Thailand, as well as development and sales departments in the USA, England, Japan, Hong Kong, Singapore, China, Greece, Australia, Spain, France and Denmark. The products are sold in more than 30 countries. Maxon Telecom Denmark is located in Aalborg, Denmark, and it employed in 2001 about 130 people, of whom 85 % are development engineers. The mobile phones developed by Maxon Telecom Denmark are sold either in Maxon's own name or under the brand name of the companies for which Maxon Telecom has developed the entire phone, or components.

Reading the content of Maxon Telecom's IC Statement

Maxon Denmark's IC Statement draws together the elements of intellectual capital and visualises them in a flow between narrative, challenges, efforts and numbers. This can be termed as a flow, because the statement can be read from any position because whenever an attempt is made to understand a proposition, it is necessary to consult the related elements. If we wish to understand effort, for example, we have to consult challenges and indicators. The whole of the statement is thus a translation between narrative and numbers that takes place all the time in an attempt to see how ordinary – yet auditable numbers - can stand for innovation. It also represents innovation as a set of practices, rather than just a moralising statement about why firms should be interested in investing more in knowledge. Figure 1 shows that R&D and innovation are problematical goals because, to be practical, they have to be translated into quite different concerns which have to be explained. In Maxon this translates innovation into the five management challenges; each of which has a set of activities attached to it, and these activities can be monitored by indicators. This table translates innovation and R&D into practical activities that a firm can undertake. Suddenly R&D and innovation are understandable and manageable. The IC statement shows how R&D and innovation works.

The indicators in Maxon Telecom's IC Statement

Indicators in an intellectual capital statement can (just like numbers in a financial statement) be organised according to the concerns of internal management or external readers. The financial statement talks very generally about three things: the composition of assets (and liabilities), investments and cash flows, and profitability. Parallel to this, the numbers in an IC Statement reveal the composition of knowledge resources, investments in upgrading knowledge resources and effects of knowledge resources. At least these numbers can be organised according to these concerns and then, if traced over time, the development in the indicators may reflect how the firm has developed and used its IC; which takes the form of various knowledge resources. Figure 2 organises Maxon Telecom's indicators according to this principle. Figure 2 shows how the numbers found in Maxon Telecom's IC Statement generally refer to four types of knowledge resources: employees, customers, processes and (possibly) technology. It is possible to identify numbers that reflect on the portfolio of knowledge resources, such as the break down on employee capabilities (employees) and project organisation (processes). It is also possible to find numbers about upgrading activities, such as participation in job rotation and formal development of qualifications (employees) as well as a collection of information about customers (customers). Numbers also talk about effects, such as staff turnover, satisfaction and experience of competence (employees), customer satisfaction (customers) and process effectiveness (processes). The characterisation of these numbers in these two dimensions is carried out based solely on the number itself, rather than on its role in the larger narrative. This allows the numbers to make general statements if analysed across time in relation to managerial concerns about composition of assets, investments in assets and effects of assets. Obviously, this is no input-output model but an accounting classification which can reflect on the numbers as such, through a process where the individual number is un-tangled from the narrative and inserted into the more general language of managerial concerns. The result of this disentanglement - the interpretation – is an input to developing and furthering the knowledge narrative when re-entangled into the storyline of how knowledge works.

It is also clear from Figure 2 that Maxon has certain risks. One risk is that seemingly there is no monitoring of the composition of the customer base. Knowing that Maxon has only one customer makes this point crucial, because then Maxon's fate is dependent on the fate of its customer; which may be risky since Maxon does not have any access to its management decisions and processes.

Furthermore, Figure 2 suggests that most of the management concerns about innovation in this firm are bridged by attention to the employee category. Innovation, it appears, is realised via efforts to manage the work force. This is the primary translation that the firm has chosen so as to make sense of what innovation is and the progress that the firm makes towards innovative results. As a translation, innovation is changed a bit and given the numbers used to track it. When we know that it is primarily about people, this provides new information about the character of innovation and when we also align this with Figure 1, there is an added translation, namely that the individual person is centrally involved in the mastering of new techniques and technologies, in maintaining a team-spirit (an organisational feature), in developing new products (which is a relation to users and customers) and in fostering timeliness in the processes of the firm. Innovation is realised through all of these concerns.

IC and innovation

Maxon shows us that innovation and R&D have to be translated into manageable concerns. Innovation and R&D are problems, rather than solutions and the IC Statement helps the firm and its partners to monitor and understand how R&D and innovation can be realised. The IC Statement helps the firm to make R&D and innovation productive ambitions; rather than ambiguous and nebulous goals.

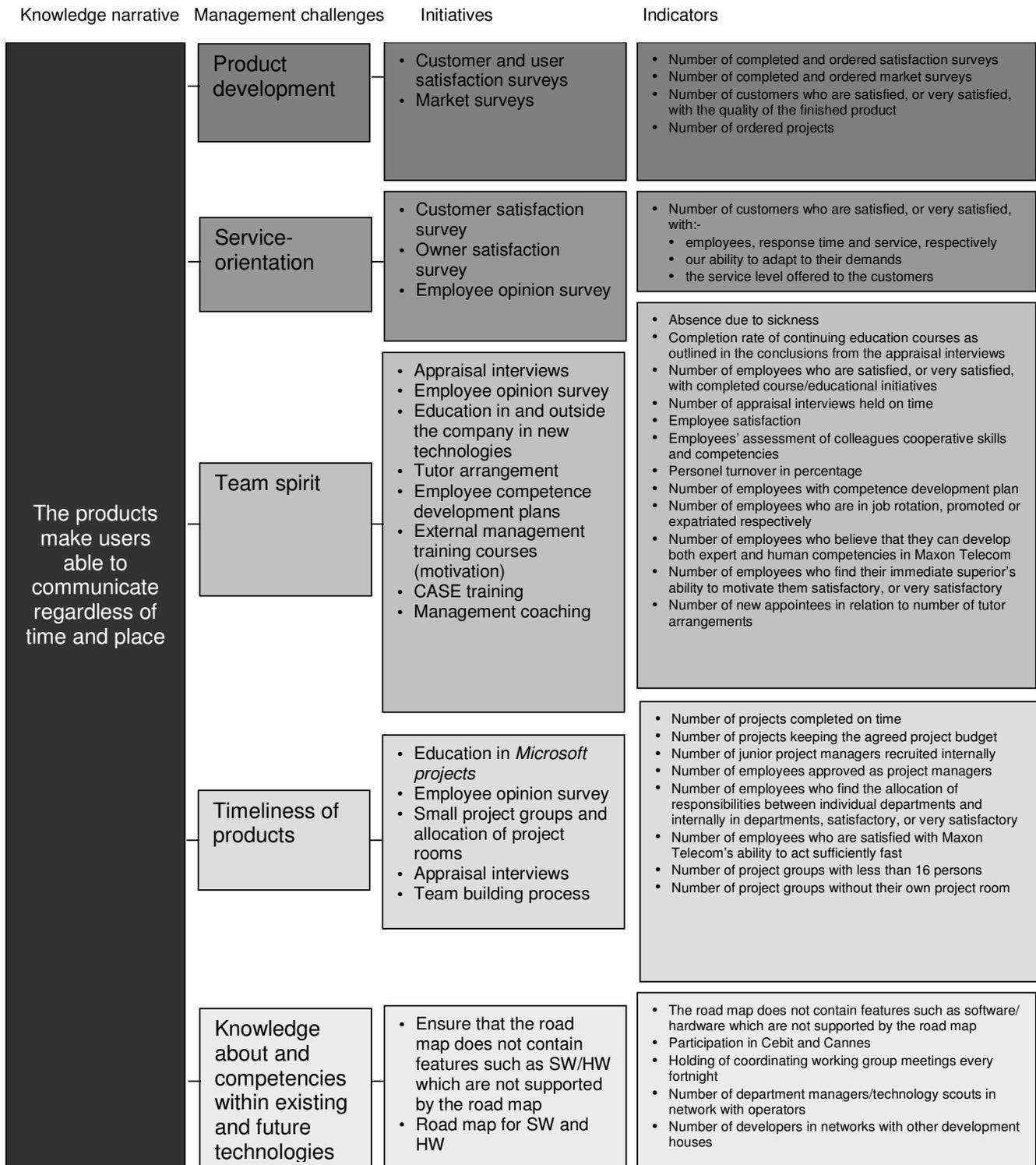


Figure 1: The structure of Maxon Telecom's Intellectual Capital Statement

ICS 2001	Effects	Activities	Resources
Employees	<ul style="list-style-type: none"> Absence due to sickness Personnel turnover Number of junior project managers recruited internally Employee satisfaction Number of employees who are satisfied or very satisfied with completed course/educational initiatives Number of employees who assess that they can develop both expert and personal competencies in Maxon Telecom A/S Number of employees who find their immediate superior's ability to motivate them satisfactory Employees' assessment of colleagues' cooperative skills and competencies Number of employees who find the allocation of responsibilities between individual departments and internally in departments satisfactory or very satisfactory Number of employees who are satisfied with Maxon Telecom A/S' ability to act sufficiently fast 	<ul style="list-style-type: none"> Number of appraisal interviews held Number of appraisal interviews held on time Number of educational wishes met as outlined in the conclusions from the appraisal interviews Number of employees who are in job rotation, promoted or expatriated respectively Number of new appointees who have completed tutor arrangement Participation in Cebit and Cannes technology exhibitions 	<ul style="list-style-type: none"> Number of employees Number of development engineers as a percentage of the total number of employees Number of employees approved as project managers
Customers	<ul style="list-style-type: none"> Number of employees who are satisfied or very satisfied with the service level offered to the customers Number of ordered projects 	<ul style="list-style-type: none"> Number of completed satisfaction surveys (market surveys) Number of answers to customer surveys 	
Process	<ul style="list-style-type: none"> Number of projects completed on time Productive time in percentage 	<ul style="list-style-type: none"> Number of on-going projects 	<ul style="list-style-type: none"> Number of project groups with less than 16 persons
Technology		<ul style="list-style-type: none"> Number of project groups without their own project room 	

Figure 2: Types of numbers in Maxon's Intellectual Capital Statement

Key messages:

Innovation is a big and abstract concept. An IC Statement helps to translate innovation into concrete and manageable concerns and questions. Through the network of narrative, management challenges, efforts and numbers, Maxon accounts for the relation between knowledge and innovation. Enterprises that do not seem to be involved in R&D and innovation, because they do not use those words, may use intellectual capital reporting to uncover hidden innovative activities. A key ingredient of any IC S is the knowledge narrative, which shows how the company's IC contributes to value creation. It shows that the relation between innovation and wealth creation is not direct and linear, but involves a combination of activities and resources.

Tools

Tool 1: Knowledge Narrative

(Based on the Danish Guidelines)

Often enterprises do not have a clear, well documented strategy. In that case it is helpful to try to create a story of the enterprise that describes what value it wants to provide to its customers and what IC it needs, to do so. This story is called a Knowledge Narrative.

A Knowledge Narrative is not an ordinary strategy, which normally consists of a number of objectives that are to be achieved. It is a narrative that in addition explains how these objectives are achieved using intellectual capital, using words like 'because' and 'therefore'. If the enterprise has already formulated a vision, the knowledge narrative can use this as a basis, adding intellectual capital to it.

The narrative starts with the value the enterprise delivers to its customers. This is the benefit that the products or services generate. It continues by describing the IC that is needed to create this value for the customer (see step 2). These two are put together using words like 'because' and 'therefore'.

Example of a Knowledge Narrative: Odense Customs and Tax Region

Odense Customs and Tax Region supplies reliable and systematic tax assessments to businesses. Through tax assessments, the business world experiences that all businesses are treated equally, because unfair competition is avoided. To achieve this, Odense Customs and Tax Region must have access to motivated and skilled employees, have a well developed tax issue database and have a very helpful culture. This should make it possible to share experiences gained and to add relevant competencies.

Tool 2: Identifying your IC by looking at your current initiatives

One way to identify the intellectual capital you have is to create an overview of existing initiatives and objectives with respect to knowledge resources. Everyday, people in your enterprise do things to optimise or make use of knowledge resources. Somebody is sent on a training course, A PC is bought. New people are hired. Dialogues with customers are started, an intranet is set up. All these actions are taken for a reason. By listing those activities you create an overview of the IC that apparently is important to the enterprise. The following table might help:

Intellectual Capital	Existing actions and initiatives	Existing objectives and strategies	Assessment of effect
Human capital	<ul style="list-style-type: none"> To ensure the right employee portfolio? To train and upgrade employees? To promote employee satisfaction? 	<ul style="list-style-type: none"> Employee mix? Training and upgrading employees? Employee satisfaction? 	<ul style="list-style-type: none"> How do initiatives affect employee contribution to creating a better enterprise?
Organizational capital	<ul style="list-style-type: none"> To document and rationalize business processes? To document and rationalize knowledge processes? 	<ul style="list-style-type: none"> Rationalization of business processes? Rationalization of knowledge processes? 	<ul style="list-style-type: none"> How do initiatives affect the benefit of the business processes? How do initiatives affect the benefit of the knowledge processes?
Technology	<ul style="list-style-type: none"> To ensure the right production technology portfolio? To upgrade existing production technology? To ensure the right knowledge infrastructure? To upgrade existing knowledge infrastructure? 	<ul style="list-style-type: none"> Ensuring the right portfolio of production technologies now and in the future? Ensuring the right knowledge infrastructure now and in the future? 	<ul style="list-style-type: none"> How do initiatives affect the added value of the technology? How do initiatives affect the added value of the knowledge infrastructure?
Relational capital	<ul style="list-style-type: none"> To ensure the right customer portfolio? To upgrade customer relations and customer competencies? To promote customer satisfaction? 	<ul style="list-style-type: none"> Customer mix? Customer relations and customer competencies? Customer satisfaction? 	<ul style="list-style-type: none"> How do the initiatives contribute to creating value to users?

2. German: Wissensbilanz

Description

www.akwissensbilanz.org

Wissensbilanz -Guideline on the preparation of an IC Statement is a German guideline supported by the German Federal Ministry of Economics and Labour. The Guideline targets SMEs, as well as other forms of organization which have a comparable structure. In particular, it targets all decision-makers in an organization, from the Managing Director via the controller and those responsible for personnel matters, to the quality management commissioner, strategy managers, knowledge managers, as well as the heads of sales and marketing. The model is drafted in six steps with four milestones.

Milestone I is the IC Statement in its simplest form. Three steps are needed to achieve it: The first step is to assess the initial situation relating to: the business environment and strategy, the intellectual capital, and a self-evaluation of intellectual capital. The target group of Milestone I is the management of the organization which can extract measures of improvement based on the results.

Milestone II targets the same group, but goes one step further in supporting the self-evaluation with indicators. In this way, self-evaluation is given further concrete form and supported using facts by means of which changes can also be measured independently of the employee's self-evaluation. The collection and assessment of indicators is at the same time a preparation for internal or external communication.

Milestone III provides a processed document, or a presentation of the organization's IC. It is adjusted towards a specific (external and/or internal) target group and describes the most important information attractively and in a structured form.

Milestone IV works out a full IC statement, which is also suited for monitoring the organization's development. It integrates correlation analyses and assessments which provide information on how long it will take until measures which have been initiated ultimately lead to business success.

Case study

Case study 6: VR-Bank Südpfalz

www.vrbank-suedpfalz.de

Case study background and objectives: *The company produced its first IC Statement in 2004. The first objective was to use the results to improve the internal implementation of the Balanced Scorecard. However, as the internal project group made the first prototype of the report and began to discuss its consequences, it was decided to also publish the results outside the company. The bank decided to communicate the report externally, exactly the way it was presented internally and to include the conclusion that the bank had to improve in the areas of customers, management processes, and competencies. The IC Statement was integrated in the annual report of 2004. In May 2005 the process of making a second IC Statement commenced.*

Main motivations to report on IC:

- *To make the intangibles more tangible;*
- *To measure and control the intangibles;*
- *To show and act as good practice. The Wissensbilanz supports more transparency and an open company culture;*
- *To have a fitness check and to analyse how the merger process affects the different branches and motivation among employees;*
- *To make more efficient use of the customer relations, as well as the relations between employees;*
- *To find out how different parts and decisions of the company have impact on the overall system;*
- *To improve the internal and external communication.*

Model used: The bank used the German Wissensbilanz model.

Main activities undertaken to acquire, improve or monitor IC resources:

- To make the vision and the strategy more clear to the employees.
- To show how different units and activities affect one another in reaching the strategic goals. The report showed in a structured way how the organisation could become a learning organisation.
- To better communicate and visualize already decided action points (change management).
- To integrate the Wissensbilanz with the balances scorecard.
- To use the Wissensbilanz as a check to assess and control operational risks.

Main results achieved: The bank integrated the Wissensbilanz with its Balanced Scorecard. Results were used to structure a new Customers Relation Centre and to integrate the services of this Centre with the Company Client Department, following the principle of 'one bank-one face'. The results and insights were also integrated in a task force implementing a new performance based salary system. Other topics currently under discussion are:

- How can the Wissensbilanz be integrated in the credit decision process?
- Shall we start a competition in the region for customers to make Wissensbilanzen together with the bank and so to acquire new customers with a good organisational fit?
- Shall we collaborate with the local government (Landesregierung) to see if the Wissensbilanz could add relevant information to support the Basel II rating?

The results from the first Wissensbilanz are now being completed with the second one. Management appraisal systems are being based on these results and indicators are being used, also for external communication purposes. As in 2004, the bank intends to integrate the Wissensbilanz in its 2005 Annual Report, thereby committing itself to following up the action points decided in the first Wissensbilanz.

It is unique to have a bank using the Wissensbilanz not only for internal purposes but also for its core business activities of risk evaluation and credit processes.

Key messages:

This case shows that the reporting of IC can be combined with a Balanced Scorecard to create a very useful tool for banks, both to improve their internal management and external reporting. By implementing it themselves, VR-Bank Südpfalz has discovered the benefits of IC Reporting and is now considering integrating it in the credit rating process.

Tools

Tool 3: Are you fit for IC Reporting?

Answer the questions below to check that you are ready to initiate the IC Reporting process.

Fitness check for the preparation of an IC Statement	Yes/No (1/0)
Are many of our employees engaged in intellectually challenging tasks?	
Have we already dealt with controlling and management systems (such as Quality Management, Process Optimisation, BSC, etc.)?	
Does our management want, and support, IC Statements?	
Is our organisation willing to devote time and resources to IC statements?	
Do the employees regard IC statements as an important project?	
Can we involve employees from various areas of our enterprise in IC statements?	
Are we willing to discuss our strengths and weaknesses openly and constructively?	
Is management open to proposals and change?	
Do we recognise "soft factors" as important success factors?	
Are future topics already touched upon and broadly discussed?	
Do we have a documented, communicated business strategy?	
Result	

Tool 4: Example structure of an IC statement:

- 1 Foreword – Why an IC statement in our organisation?
- 2 Company description
- 3 Business success and challenges
- 4 Business and knowledge strategy
- 5 Our intellectual capital
- 6 Future perspectives and measures
- 7 Collection of indicators

3. Austrian: ARC IC Report*Description*

www.arcs.ac.at

The ARC IC Report is a model developed by the Austrian Research Centers. The logic of this model combines goals, intellectual capital, knowledge processes and intangible results. The process of acquiring, applying and exploiting knowledge starts, with the definition of specific knowledge goals, which can be derived from the corporate strategy. Knowledge goals define the areas where specific skills, structures and relationships should be built up, or increased, to ensure that the corporate strategy can be put to work. These goals shape the framework for the exploitation of the IC, which is composed of Structural, Human and Relational Capital. These intangible resources are the input for the knowledge production process, which, in turn, is manifested in the different kinds of projects or processes carried out in the organization. In the case of research-intensive organizations, the processes are noticeably different kinds of research, such as basic research, applied research, contract research projects, but also include services, teaching and etc.

The Model provides a framework for its adaptation and adoption by other research-intensive organizations. When applying the model, organizations have to formulate explicitly the organizational goals relevant for the knowledge-based resources and processes. These organizations have to define their key processes and, if requested, additional categories for the results. This model, which is especially designed for research-intensive organizations, can explain to investors and shareholders how R&D represents a sound investment. Using the indicators of goals and results, managers of research-intensive organizations can show how R&D and other complementary assets yield returns on investments.

*Case study***Case study 7: Austrian Research Centers**

<http://www.arcs.ac.at>

Company Profile: The Austrian Research Centers (ARC), is the biggest RTO (Research & Technology Organization) in Austria with both public and private owners; it operates as a private limited company. Its main role is to perform a transfer function between the basic research carried out at universities and the applied research and development needed in companies. It has 720 employees and a turnover, in 2004, of 96.2 Million Euro.

Case study background and objectives: ARC uses IC Reporting for internal management tasks as well as for communication with external stakeholders. The IC statement is a separate report that supplements information provided by the Annual Report.

Main motivations to report on IC:

- Illustration of the development of IC;

- *Explanation of the achievements of research and their benefits to stakeholders;*
- *Creation of transparency about the use of public funds;*
- *Identification of future areas of promise and tracking their possible future benefits;*
- *Revealing leverage effects and externalities which are part of the performance potential of ARC.*

Model used: ARC has developed in-house its own IC Reporting model.

Main activities undertaken to acquire, improve or monitor IC resources: *The development of the IC is measured by the annual gathering and interpretation of indicators. These indicators are interpreted by a comparison with company goals, an analysis of their development over the years and a comparison with other RTOs. Certain indicators are also used within other management departments, such as the Human Resources Department.*

Main results: *The IC statement visualises the knowledge production process and contributes to its improved understanding of the process within ARC. IC, consisting of human capital, structural capital and relational capital is interpreted as the main source for the value creation process. The main internal benefit of carrying out the process is that of facilitating the annual discussion about the knowledge goals, the corporate strategy and the interpretation of indicators, especially in comparison to other RTOs. The process itself is more important than the report. Externally, by using IC Reporting, ARC was able to improve the level of trust with its partners (research funding agencies, customers, etc.) and was thus able to raise additional research funds.*

Key message:

IC Reporting can be a valuable tool for R&D intensive enterprises as it can help them to understand their knowledge-production process and improve the relationship with partners and funding agencies.

4. Spanish: Intellectus Model ®

Description

http://www.ofenhandwerk.com/oklc/pdf_files/K-4_deCastro.pdf

The Intellectus Model ® (Modelo Intellectus®) facilitates the R+D decision making process by bringing into focus a series of key factors that directly influence the results of an organization's innovation. Within the different classes of IC the following aspects are highlighted:

- Human Capital:
 - Watchful culture;
 - Researcher's qualifications.
- Structural Capital:
 - Full time research staff;
 - Projects in hand;
 - Equipment;
 - Intellectual and industrial property.
- Relational Capital:
 - Scientific alliances with public centres;
 - Associations;
 - Collaboration with companies.

In this way the decisions can be related to the value attached to each of the variables according to a series of indicators. The variable 'R+D effort' is not limited to only financial resources but also to people and projects.

It could be said that the model provides an abstract representation of all of the intangibles required by company management. To the extent that the indicators reflect a particular organization's capacity to generate future income, it can provide extremely valuable information to investors and the financial markets about its real situation. The IM addresses IC by separating it into 5 classes so that it is possible to study its components separately without overlooking aspects of the interactions

which link organisational results and the creation of inter-relational dynamics, similar to the principle of cause and effect. In this sense, the knowledge base that is needed for the development of R+D is linked to the organization's Human Capital as well as to its relations, both internal and external. In turn, the internal relations are linked to the structures and the equipment that facilitates communication, exchanges and team work, whereas the external relations involve the flows of knowledge and information resulting from networks and contacts, both with those agents directly involved in the business as well as with others that are nearer to its social environment.

Case study

Case study 8: GENETRIX

www.genetrix.es

Company profile: GENETRIX is a biotechnology company in Spain employing 40 people.

Main motivation to report on IC: External communication to financiers, authorities, and society was Genetrix's main objective in preparing an IC report. The IC statement has helped to develop Genetrix's business case at the start of the enterprise. Thanks to its originality, clear value added and relevance, the report has facilitated the raising of 20 M€ in external capital and the financiers have made highly favourable comments on the report's value. The improvement of internal management processes shall be tackled in the second phase, which is already beginning to take shape in the definition of strategy and a significant change in the way in which the organisation presents itself via its web site. In fact, the structure of the web site follows very closely the structure of the IC report, thereby manifesting the close relationship between the image reflected in the ICR, the reality of the organisation and the way in which it wants to be perceived.

Model used: GENETRIX used the Intellectus Model ® (MODELO INTELLECTUS®)

Main knowledge activities undertaken to acquire, improve or monitor IC resources:

Human Capital:

- Staff selection by means of very thorough criteria.
- Commitment to staff development and coordination through "company meetings".
- Development of managerial capacities.

Structural Capital (organizational):

- Strategic and progressive growth.
- Taking advantage of the managerial structure for the spin offs as they come along.
- Commitment to the creation of an internal knowledge portal (KM software and intranet).

Structural Capital (technological):

- Permanent technological up-dating.
- Acquiring the necessary equipment.
- Exploiting the set of patents.

Relational Capital (business):

- Establishing the set of clients and suppliers.
- Making manifest the set of partnerships.
- Making manifest the network of experts.

Relational Capital (social):

- Valuation of the social responsibility.
- Tracking the impact in the mass media.
- Valuation of the acknowledgements and prizes.

Main results achieved:

- Obtaining external funding.
- A structured and strategic reflection about the intangibles as a key factor in developing strategy (development of strategic thought in a hitherto hidden area).
- Identification and measurement of the intangibles that really matter to the organisation.
- Reduction of the external information asymmetry and improvement of its valuation.
- Improvement of the intangibles' internal management processes.
- Taking advantage of the model to achieve a reorganisation of and reflection about different departments.

▪ *Increasing the staff awareness of the importance of managing the intangibles and developing KM activities*
Key message: *In the start-up phase of an enterprise, the creation of an IC statement can help structure the business plan, create transparency to potential investors, and show the added value of the business proposition, while the originality of this way of reporting can also contribute to the ability to raise seed capital.*

5. Swedish: IC-Rating™

Description

www.intellectualcapital.se

IC-Rating™ is an initiative of Intellectual Capital Sweden, a private company specialized in measure and describe non-financial assets that are not reported or described in traditional financial statements. IC-Rating™ is based on three focus areas:

- Efficiency - Present value of IC efficiency in creating future value
- Risk - Threat against present efficiency; probability of threat coming true
- Renewal and Development - Efforts to renew and develop present efficiency

The IC-Rating™ looks at the three pillars of IC: the Human, Structural and Relational Capitals.

The rating was inspired by the IC Value scheme from Leif Edvinsson and work from Karl-Erik Sveiby, and distinguishes between Human, Organisational and Relational Capital. All these dimensions are then measured in relation to how well they are functioning in relation to the strategic goals of the company (the Business Recipe). Each dimension receives a rating grade for 1) Current efficiency: how well is the dimension functioning today? 2) Risk: what is the risk that the current efficiency will decline? 3) Renewal/Development: to what extent do current activities contribute to improving the current efficiency?

IC Rating™ is a standardized methodology for rating Intellectual Capital. The methodology has been developed since 1997, and has been tested empirically in more than 250 cases. The primary source in the information gathering process is in-depth interviews with stakeholders, internally (management and employees) as well as externally (clients, partners, distributors, suppliers etc). An IC Rating™ measures some 230 IC related parameters. Each parameter has been converted into a question. Each respondent in the in-depth interview is asked some 80-100 questions, and is asked to rate each question on an eight-graded scale. These grades are then aggregated to the rating grades shown in the appendix. In addition to the rating grades, all relevant quotes and comments are recorded during the in-depth interviews, and later summarized in an anonymous document that allows the organisation to understand the rating grades at more depth.

Case study

Case study 9: Compomeasure (not their real name)

Company profile: *Compomeasure is a niche-player in the telecom sector, headquartered in a North European country. It develops state-of-the-art equipment for testing and measuring components, primarily used in broadband fibre networks. It has 30 employees.*

Case study background and objective: *Compomeasure was founded in the 1980's and decided to attract external investors in the late 1990's in order to be able to become a global player in this very R&D intensive environment. When additional capital was required in the 2000's, they decided to use the IC Rating™ tool in order to report their IC assets to potential investors. The IC statement based on IC Rating™ was primarily used to communicate the current state of the organization's IC to a limited*

number of potential investors. This was done as an addendum to the investment memorandum. The outcome also served as a basis for current shareholders to determine whether to continue supporting the company in future investing rounds and to help them prioritise their Board discussions.

Main motivations to measure and/or report on IC:

- To expose in a transparent manner the current efficiency and future risk of the organization's IC to potential investors;
- To help current shareholder's determine whether they should invest more money in future rounds;
- To help the Board and management get a unified view of current and future challenges;
- To help the management prioritize future investments of time and money;
- To communicate current and future challenges to all personnel.

Model used: IC-Rating™¹⁷

Main results: The results were more or less typical for a small R&D intensive company. In particular, there were very high risks both in the business recipe and in the customer base. This is not surprising as Compomeasure depends heavily on a small number of large customers. The rating also indicated a very high risk in the Intellectual Properties, however, the new funding was primarily being sought to alleviate this threat. For management, there were many key takeaways. For example, the employees have a very high degree of efficiency, but they are not renewing their competence sufficiently. Now that they have ventured on a growth strategy they also need to pay more attention to their processes. All in all, the rating in itself was not entirely positive. Despite this, Compomeasure had no problems in securing additional financing and the new investors partly attributed their positive decision to the unparalleled level of transparency in the company as a result of the IC Report. They knew what their money would be used for, and they could see why additional funding was needed. "For the first time I actually know what I am getting myself into", commented one investor.

The IC Rating™ was the foundation for most Board discussions over the following year. It was also used as the foundation for the organization's own strategic discussions, involving all personnel. This company has moved on to become very successful and has attracted more than 20 million Euros in additional funding. The majority of this funding has been tagged for R&D investments.

Key message: This case shows that even when an IC statement is not entirely positive about a company, the transparency it creates can help to attract funding for R&D.

6. Belgium: ICV calculation

www.areopa.com

Description

ICV calculation has been developed by Areopa, a Belgium consultancy company specialized in change management, knowledge management and IC measurement. IC Value calculation is a complete set of 77 formulas that can be applied for a comprehensive calculation of the IC Value of a company, or organization.

Case study

Case study 10: Company X

Company profile: 700 staff (organization: Management: 85, Employees: 270, Production Workers: 360, Annual training budget: 1.8 M€).

Case study background and objectives: Customer satisfaction surveys (internal and external) showed that for Company X:

- Reporting in general was late, incorrect or even completely neglected;
- Although the information was available, the time to process the information took too long;
- Response time to get information to management or customers was too slow.

To improve reporting, training and coaching was needed. Management was willing to invest if and when the return on investment could be demonstrated before the project was started and reasons for failure or success could be clearly outlined, thereby enabling proper evaluation and decision-making. Traditional

¹⁷ More information on IC-Rating™ is available at: www.intellectualcapital.se

methods focus on the cost of training, but fail to calculate the effects (results) achieved by a particular training. In IC terms: a training should add knowledge to the individuals and thus to the organization. In other words, the structural and non-structural Human Capital values should increase. If this were not the case, then the added value would be zero and the investment would not be worth pursuing. The objective of the assignment was exactly that: to measure the level of knowledge before and after the training sessions and put a value on the delta realised as a result of a particular training program.

The model used for IC Reporting: *For this particular case a limited set of formulas from IC Value (ICV) calculation were used to demonstrate the 'effect' of particular training programmes with respect to the increase/decrease of 'IC' of the trainees and the organization as a whole.*

Results:

The outcome of the calculations showed that:

- *The training sessions yielded both an operational benefit as well as an increase in the IC Value (ICV) of the organization. Only if and when enough ICV could be created, could the long term operational benefit be sustained;*
- *Learning curve effects cease to have a positive impact on productivity growth after a certain period of time, requiring new training efforts;*
- *Based on the formulas €-values could be calculated providing information on the effect of training sessions on general financial performance, knowledge transfer of IC and structural and non-structural Human Capital;*

allowing management to compare options and to take sound decisions.

Key messages:

ICV calculation is complex and very time consuming, because a lot of data need to be collected and interpreted and quite a number of calculations need to be carried out and put into perspective. Since IC clearly comprises distinct areas, ICV techniques can be used to calculate very specific sub-sections of elements that are part of the IC of an organization or a company. In this particular case the efforts focused on the calculation of the increase of the structural and non-structural Human Capital Value of an organization as a result of particular training sessions, allowing management to concentrate resources on real value creating efforts, instead of focusing on the 'cost-effectiveness' (i.e. the cheapest training sessions available).

7. French: IC-dVAI®

Description

The IC-dVAI approach was developed by Ahmed Bounfour, Associate Professor Research Programme on Intangibles, University of Marne La Vallée. **The IC-dVAI®** is a strategic approach to IC from a dynamic perspective. The approach has been implemented under different contexts, at microeconomic as well as at macroeconomic levels. As far as metrics are concerned, these have to be defined dynamically along four important and interrelated dimensions of competitiveness:

- Resources as inputs to the production process: tangible resources, investment in R&D, acquisition of technology, etc.
- Processes. It is through processes that the deployment of a dynamic strategy founded on intangible factors can really be implemented.
- The building of intangibles (IC). These can be built by the combination of intangible resources.
- Outputs. It is on this level that performance of organizations is classically measured, through the analysis of their products and services' market positioning.

The IC d-VAL® defines and measures IC in terms of relative indexes as well as in monetary terms. The starting point is a clear definition of the main components for the four dimensions – Resources, Processes, Assets and Outputs. Then a benchmarking process is conducted for these items. Basically we compare the position of a company or a nation to those considered as best performers. The benchmarking exercise leads to calculating ad hoc performance indexes, as well as to a composite index per activity, company, group, country, region or any community.

Case study

Case study 11: Data Processing in the Engineering Department of a Large Airline

Company profile: The company is an important international airline. The internal department for data processing used IC Reporting to benchmark its position against other airlines. For this department, the principal key factors of competitiveness are those relating to the improvement of the quality of the supplied service and to the realisable reduction in cost, due to the methodological developments implemented.

Case study background and objectives: From the point of view of the leaders of the department, it is important to develop internal resources with the intent to deliver "world class" service. To ensure such a quality of service, a hierarchy of criterion was established. Several factors were identified as particularly critical:

- For the resources: the investment in R&D and innovation, the general level of the financial resources available to the firm and the quality of technology and knowledge held by the firm.
- For the processes: the ability to combine intangible resources with the processes and systems dedicated to the creation of new knowledge.
- For output: the quality of the internal services.

The model used for IC reporting: The IC-dVAI[®] (Intellectual Capital dynamic Value¹⁸)

Main findings: The benchmarking of the competitive positioning of the department compared to those best in class showed that the department is positioned better in terms of output and resources than in terms of processes. The total index of performance was good, even though progress could be made on some items.

Key messages: This case study illustrates the possibility of valuing three aspects of IC: resources, processes and output. This offers several advantages:

- benchmarking corporate performance;
- correction of the market's possible value overestimates;
- the indication of areas of improvement;
- the possibility of developing performance indicators directly connected to operational responsibilities such as: the direction of research for investment in R&D, the direction for product design responsibility, development that optimises the "time-to-market" constraints, or the direction of human resources for the motivation and the development of human capital, whether it is considered on the individual or collective level;
- the development of a "signalling" policy that addresses the main internal and external stakeholders;
- the presentation of a reasonable indication of the value of the firm.

8. European: MERITUM

www.uam.es/meritum

Description

The MERITUM project was developed jointly by research groups from Spain (coordinator), France, Norway, Sweden, Finland and Denmark. **MERITUM** Guidelines for Managing and Reporting on Intangibles provide a common framework for the identification, measurement and control of intangibles as well as proposing criteria for the disclosure of information on the intangible determinants of the firm's value. The purpose of the Guidelines is, on the one hand, to assist companies in the development of their ability to identify, measure and control its intangibles, in order to increase the efficiency of their management and to improve their financial performance. On the other hand, the Guidelines attempt to provide useful guidance for firms willing to disclose information on the intangible determinants of their value creation capability, in order to help the providers of capital to efficiently estimate the future payoffs and the risks associated with their investment opportunities. MERITUM distinguishes between Human, Structural and Relational Capital.

¹⁸ The IC-dVAI[®] has been developed by A. Bounfour. (Bounfour, 2000, 2003)

Case study

Case study 12: INGENASA

www.ingenasa.es

Company profile: INGENASA is a biotechnology firm working in the area of animal health. It has 33 employees and a turnover in 2004 of 2.1 million Euros. It is a highly qualified company with 52% of the employees university graduates and 40% holding a PhD. Its customers, suppliers and R&D partners are important sources of innovation.

Case study background and objective: INGENASA is a small company that has not made any previous attempt to measure, manage or publicise its IC. However, it has recently decided to apply the MERITUM model and Guidelines to the company and learn from the experience. Accordingly, a process of identification of its critical intangible resources and activities has been developed and a set of indicators to manage and monitor them has been constructed. The indicators have been checked against a series of characteristics such as: relevance, objectivity, reliability, feasibility, and usefulness. The IC Statement that has been produced will be used for internal management purposes. The company is also willing to combine it with the Annual Report.

Main motivations to report on IC: An IC Statement is a good internal tool to spread and communicate the vision and mission of the company within the organization. As an external tool it is a good way to show to stakeholders the value creation process of the firm in a systematic manner, focussing on aspects of crucial importance for a firm like INGENASA: knowledge creation and innovation.

Model used: The company implemented the MERITUM model.

Main activities undertaken to acquire, improve or monitor IC resources: INGENASA is a highly innovative company and its main structural capital activity is R&D; to which it devotes 50% of its turnover. Its main aim is to create knowledge and innovation. Most of its supporting activities – such as the permanent training of all employees, the activities to acquire R&D funds, both at national and international level, and meetings with suppliers, customers and partners – are aimed at knowledge creation. The company also codifies its knowledge by developing internal manuals and protocols and by registering and maintaining patents, which are afterwards licensed. Internal quality assurance processes and employees' and customers' satisfaction surveys are also usually undertaken.

Main results: During the exercise of creating the IC report, the management of INGENASA realized that the company had many intangible resources and that it was undertaking many intangible activities. However, these resources and activities were not measured and the IC Reporting exercise helped to create some very simple indicators; like the percentage of revenue coming from new products. These indicators can show the potential of the company to stakeholders. The exercise has helped the company to realize that there is a need for company routines to monitor IC and a need to market this within the firm. In a small company it is a necessary that all employees be convinced of the importance of IC Reporting for the company. The management believes that IC Reporting can make the investments of the company in knowledge more visible and that as a result, the company may become more attractive to potential business angels or venture capital investors.

Key message: This case shows that starting an IC Reporting exercise can produce a lot of new insights into the company thereby highlighting the importance of IC resources and activities for company success.

Tool

Tool 5: Characteristics of the Indicators

A long list of indicators can be a burden for a company. It may increase its management cost without providing clear benefits. Companies need to make sure that the indicators they are constructing fulfil a set of characteristics to make the effort interesting and worthwhile.

The characteristics are the following (source: MERITUM [2002])

USEFUL						
Relevant			Comparable	Reliable		
Significant	Understandable	Timely		Objective	Truthful	Verifiable
Feasible						

USEFUL: allows decision making both by internal and external users.

RELEVANT: provides information that can modify or reassure the expectations of decision makers. To allow this, they should be:

- **SIGNIFICANT:** related to issues critical for the companies,
- **UNDERSTANDABLE:** presented in a way it is easily understood by potential users, and
- **TIMELY:** available when it is required for analysis, comparison or decision making purposes.

COMPARABLE: presented following general accepted criteria, so that users may make comparisons over time and across companies, and

RELIABLE: trustworthy. This requires the indicators to be:

- **OBJECTIVE:** the value is not affected by any bias arising from the interests of the parties involved in the preparation of the information,
- **TRUTHFUL:** the information reflects the real situation, and
- **VERIFIABLE:** it is possible to assess the credibility of the information it provides.

FEASIBLE: the information for their elaboration can be obtained from the company's information system, or the cost of modifying those systems to obtain the required information should be lower than the benefits (private or social) arising from the use of the indicator.

9. Japanese: Guidelines for Disclosure of IA Based Management

http://www.meti.go.jp/policy/intellectual_assets/GuidelineforIAM.pdf

Description

The Guidelines for Disclosure of Intellectual Assets Based Management were published by the Japanese Ministry of Economy, Trade and Industry. They describe the outline of a voluntary intellectual assets based management report that explains the probability of future cash flow by using intellectual assets as sources of future profits as well as historical performance. The guidelines suggest that an intellectual assets based management report should have the following structure.

[Main body]

(General) Basic management philosophy

Outline of business characteristics

(From Past to Present)

A: Management policy in the past

B: Investment (based on A) (performance figures included)

C: Unique intellectual assets accumulated in the company, strengths based on them, and value creation method (based on A and B) (supporting intellectual assets indicators included)

D: Actual performance in the past, such as profits (as a result of value creation C) (figures included)

(From Present to Future)

E: (Based on C and the assessment of the past to the present) Intellectual assets that rooted in the company and will be effective in the future, and future value creation method based on them (supporting intellectual assets indicators included)

F: Identification of future uncertainty/risks, how to deal with them, and the future management policy including those elements

G: New/Additional investment for maintenance and development of intellectual assets needed (in line with the management policy F) (figures included)

H: Expected future profits, etc. (based on E to G) (numerical targets included)

[Attachment]

Other intellectual assets indicators (optional)

In addition, the guidelines provide a comprehensive list of possible indicators in the area of:

- Management stance/ Leadership
- Selection and concentration
- External negotiation power/ relationships
- Knowledge creation/ innovation/ speed
- Teamwork/ organizational knowledge
- Risk management/ governance
- Coexistence in society

10. Australian: Guiding Principles on Extended Performance Management

The Australian Guiding Principles on Extended Performance Management were developed by the Society for Knowledge Economics. The Society was established in June 2005 following a mandate from the Australian Government Consultative Committee on Knowledge Capital and the Australian Government Information Management Office. The Society's founding members include CPA Australia, the Institute of Actuaries of Australia, the Australian Government Consultative Committee on Knowledge Capital and Microsoft Australia.

The Guiding Principles propose a framework for structuring an extended performance account that supplements traditional financial statements. The framework distinguishes between three forms of intellectual capital: humans capital, structural capital and relational capital. It suggests that for each type of capital, companies report on their strategic objectives, their managerial efforts (both current and planned), and related indicators; including indicators on the external social, environmental or economic impact of the efforts. The aim is to produce a one-page account, which provides a summary of the value and performance of the organization's knowledge intensive resources and activities relative to its strategic objectives.

	Strategic Objectives	Managerial efforts		Indicators (External and Internal)		
		Current activities	Planned actions	Indicators	Past/ Current	Target
		Relational capital				
Structural capital						
Human capital						

Appendix H. The AIAF model

The AIAF model for evaluating company communication on intangibles (2002)

In recent years the Italian Association of Financial Analysts (AIAF) has become involved in the study of several issues about intangibles (in particular for explaining the growing differences between the values of companies, as disclosed in the financial statements, and the values expressed by the stock market).

One study, realised in cooperation with the University of Ferrara, has specifically examined intangible asset communication (AIAF, 2002).

The aim of this study is to create a company classification system on three levels, depending on the company capacity to provide information about its intangibles.

The model is based on a three-dimensional framework (Figure 1). The three dimensions are the following:

- the nature of information: forecast and actual;
- the five communication dimensions: strategy, customers and markets, human resources, processes and innovation, and finally, organisation;
- the level of depth in communication: "minimum" information, "reasoned" information, and "extended" information.

The model should, in principle, be applicable to different industries. Obviously, for certain industries the information on several dimensions might be unavailable or it might not be relevant for the analysis. For example, the processes and innovation dimension is unquestionably relevant for new economy companies, but not for companies operating in traditional markets (even though intangibles are always important for all types of companies).

As to the level of depth in communication, there is also a "zero" information level where the information provided by the company covers none of the five communication dimensions. In such cases, the analyst is not able to formulate any estimation given that data available is inadequate.

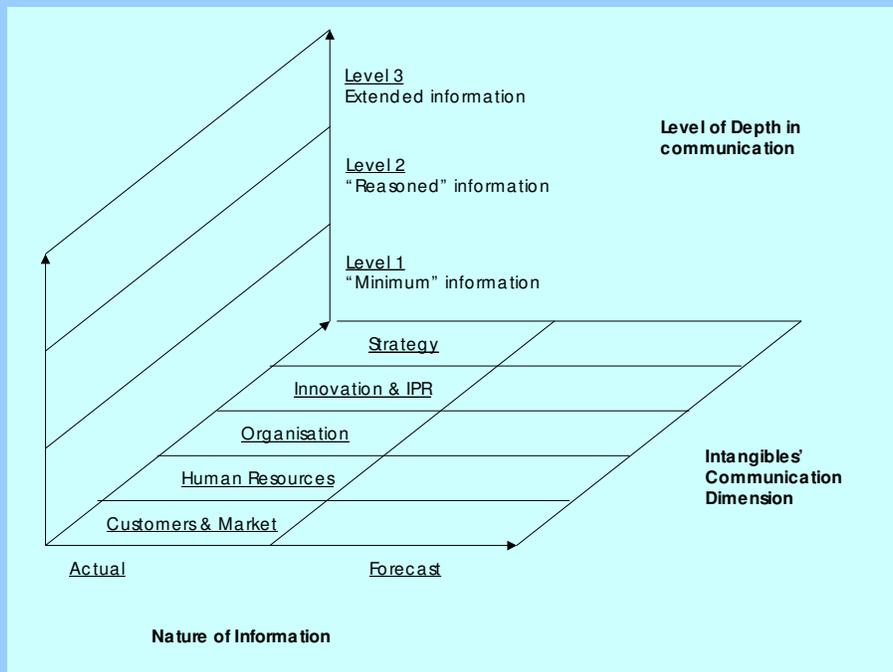


Figure 1: Basic AIAF Framework Source: AIAF, 2002

The types of information considered are set out in the following Table.

Customers & Market	Human Resources	Organisation
<ul style="list-style-type: none"> • Customer (name, number, localisation, type, etc) • Supplier (number, localisation, etc) • Market (description, market share, etc) • 	<ul style="list-style-type: none"> • Employee (number, number of woman, full-time, part-time, etc) • Remuneration policy • Employee policy • Training activities • 	<ul style="list-style-type: none"> • Organisation chart • Factories (number, localisation, etc) • Cultural activities • Organisational structure (description) •
Innovation & IPR	Strategy	
<ul style="list-style-type: none"> • R&D (activities, expenses, investments etc) • Researchers (number, name..) • Technologies • Objectives and organisation • 	<ul style="list-style-type: none"> • Strategy (plan, agreements, etc) • Focus, mission • Target and objectives • Environmental or social policy • 	

The specific characteristics of the first information level on intangibles are as follows:

- Included in the statutory and consolidated financial statements of the period;
- Mainly directed towards actual figures;
- Must ensure at least the minimum coverage of the five dimensions identified;
- It is largely qualitative.

In this case, the objective of the company is to provide the analyst with a clear outline of the company's strategy and the key variables that management keeps under control for the purposes of carrying out this strategy. Through these first indications, perhaps the analyst will not be able to define a complete method for assessing the intangible capital; however, it will be possible to have an idea of how the company's intangibles may be made up. This level allows the analyst to formulate at least a "minimum" image of the intangible investment of a company, whilst this is not possible with "zero" information.

The distinguishing factor between this basic level and level "zero" is the ability to provide a non-partial outline of the subject. Perhaps the company is communicating very general information that is highly approximated; nonetheless, the 5 dimensions of communication described above should all be covered and detailed.

The principal weakness in this level of information is due to the scarce inclination to provide forecast elements, which, as already mentioned, constitute one of the most important areas for evaluation purposes.

Level 2 – "Reasoned" information

The specific features of the second information level on intangibles are the following:

- Included in the statutory and consolidated financial statements of the period;
- Also directed towards forecast information;
- Organised according to the logic of "IC Reporting".

The second level assumes that the company has commenced an "ad hoc project" for communication relating to the subject of intangibles. This level reflects then the company's intention to increase its communications concerning intangibles.

The document used as a reference is still the consolidated financial statements, in which a section could be created that summarises all of the information relating to intangibles. The management report would appear to be an ideal document for this information, although some sections of the notes to the accounts could also be dedicated to these matters.

The information provided may be similar to the first level, but the forecast element should be accentuated. In particular, for each of the five dimensions indicated, information should be provided, including qualitative indications, regarding the expected development of the dimension, the company's strategy and the related general objectives.

	Year -2	Year -1	Year 0	Objective
Customers Number of active clients Market share Retention rate Personnel Employees by category Average employee cost by category Turnover Organisation Organisation chart Peripheral organisation and locations Value of licenses Processes and innovation New products Turnover breakdown for new products (analysed by phase of corresponding life cycle) Research costs Strategy Financial indicators (ad hoc and aimed at providing a picture of the general strategy progress described in the related section) (e.g.: degree of diversification= principal product turnover / total turnover , profitability=ROE...)				

Figure 2 – Example of a concise control table for IC information

The information contained could be summarised in a concise control table, as per the structure set out in Figure 2. This could include 15/20 indicators that, interpreted through the qualitative information used to represent them, could favour a general understanding of the subject area and, in particular, provide a measure that is comparable over time.

Level 3 – Extended information

At the third information level the company draws up a specific document relating on intangibles (cf. IC Report). This document may be structured on the basis of the five dimensions of communication, or more, and each section may include qualitative and quantitative information on the company's intangibles.

Each section will contain an extended level of information with:

- Qualitative descriptions;
- Quantitative data;
- Actual data and forecast information.

We set out below a sample summary of an IC statement (Table 2).

Sect I	Strategy
	1 The company-products & services
	2 The market
	3 Competitors
	4 Development prospects (internal growth vs external growth)
	5 Commercial/industrial alliances
Sect II	Customers
	6 Reference market (analysis per customer, geographical area, products, points of sale, ...)
	7 Market share
	8 New clients
	9 Profitability margin of the activity
	10 Investment in client acquisition
	11 Investment in client maintenance
Sect III	Personnel
	12 Employees (number and breakdown)
	13 Remuneration structure
	14 Average employment history/length of service in the company
	15 Turnover
	16 Training
	17 Ability to attract qualified resources
	18 Level of qualification
	19 Management
Sect IV	Organisation
	20 Organisation chart
	21 Locations (offices and factories)
	22 Licenses
	23 Suppliers (number, turnover, certification processes, ...)
	24 Description of information systems
	25 Structure functioning (support systems, shared databases, network connections,...)
Sect V	Processes & information
	26 Description of sector innovation processes
	27 Technology utilised
	28 New ideas/projects/products implemented
	29 Investment in product development
	30 Investment in new product development (design-implementation)
	31 Breakdown of turnover for new products (analysed by corresponding life cycle phase)
	32 Institutional research activities (publications, ...)
Sect VI	Forecasts and objectives

Table 2 - Sample Summary of an IC Statement

In order to facilitate the assignment of a company's IC information to one of the three levels of communication, a radar diagram was designed, still in collaboration with the University of Ferrara (Figure 3). This graphic helps to represent the results obtained and it facilitates conclusions. The diagram can also represent both the level of information supplied by an individual company and the level of information supplied by a sample of companies.

The scale goes from 0 to 15, representing the measurement of communications capacity. A "zero" score represents a zero information level; on the other side of the scale, a score of 15 represents optimal (extensive) information. Between these two extremes, two intermediate information levels have been identified: insufficient ("minimum"), with a score of 5, and sufficient ("reasoned"), with a score of 10.

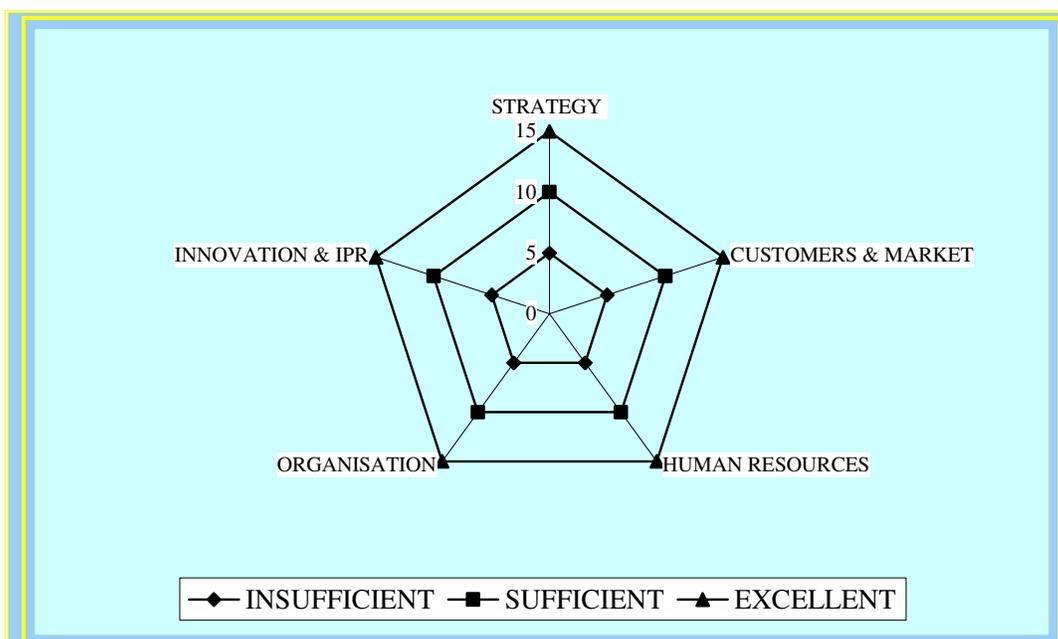


Figure 3 – Radar Diagram Source: AIAF, 2002.

In conclusion, given that the implicit value of intangibles translates into more justifiable, future profit benefits, a complete analysis of the intangible factors must be such that the analyst may independently form a more precise opinion on the short and medium term projections of the company valued as a whole. This opinion may be expressed using various approaches and methods:

It may be expressed as a summary indicator formed on the basis of properly organised information gathered in the IC statement;

or

It results in a corrective factor as an additional, adjusting component of the basic valuation parameters and, in particular, in relation to the cost of capital.

The final result of the analysis could be that of refining the estimated cost of capital for the company. A lower cost of capital would be obtained in those situations where the value of intangibles is much higher than the sector average; similarly a higher cost of capital would be attributed to companies in the opposite situation. What we would like to point out here is that the absence of information on this subject leads to conditions of high volatility.

Appendix I. The ELIOP case

Company profile: The company is working in the area of control systems. It employs 150 employees. Its turnover in 2004 was 18.3 million Euros.

Case study background and objectives: The company started to produce some information on IC in 1997. At that moment a few indicators were produced for management purposes and used in the narrative part of the Annual Report. From 1999 onwards the company applied the MERITUM model and between 1999 and 2002 a knowledge narrative and a set of indicators was published as part of the Annual Report. However since 2002 the disclosure of this information was stopped and the information obtained from the model is now only used for internal management purposes. The reason is that the company feels that disclosure is only useful if the market and the stakeholders appreciate it and if comparison with other companies is possible. This was not the case as Spanish financial institutions did not seem to react favourably to IC information and not many companies, in the same or other industries, were keen to produce IC Reports. Without commonly accepted concepts and internationally agreed upon definitions for some of the indicators for IC, the company felt that the effect of reporting on IC may be counterproductive because an indicator may be understood in the wrong way by an external reader.

Main motivations to measure and/or report on IC: The company felt that it is extremely useful for strategic decision making, since the IC Statement reflects much better the real value of the company than the financial statements.

Model used: The company follows the MERITUM model and distinguishes between Human, Structural and Relational Capital.

The **MERITUM** Guidelines for Managing and Reporting on Intangibles provide a common framework for the identification, measurement and control of intangibles as well suggesting criteria for the disclosure of information on the intangible determinants of the firm's value. The purpose of the Guidelines is to assist companies in the development of their ability to identify, measure and control its intangibles in order to increase the efficiency of their management and to improve their financial performance. In addition, the Guidelines attempt to provide a useful guide for firms willing to disclose information on its IC in order to help the providers of financial capital to estimate efficiently the future payoffs as well as the risks associated with their investment opportunities. MERITUM distinguishes between Human, Structural and Relational Capital.

Main activities undertaken to acquire, improve or monitor IC resources: As a result of working with the IC Report, the main focus of the management of ELIOP turned on the following activities:

- Human Capital: a) Rotation; b) Employee satisfaction; c) Training
- Structural Capital: a) Technology and Innovation activities; b) Follow up of turnover coming from innovations and new products
- Relational Capital: a) Customer satisfaction; b) Long term customer relationships; c) Communication

Main findings:

- The IC Reporting process has helped ELIOP to define precise objectives for its R&D and to manage and monitor the development of its R&D activities.
- Job rotation and permanent monitoring of employee satisfaction has improved the working climate and has increased productivity.
- The organization of the R&D function has been changed drastically. Before the use of IC Reporting there were two different positions, a) the product manager (responsible for R&D activities) and b) the project manager (responsible for marketing activities). They cooperated at different stages in the production process. After the implementation of IC Reporting, there is just one person who plays the two roles at different moments of time. The higher integration between the two departments has resulted in greater efficiency and efficacy of the whole process.

Key message:

ELIOP felt that there was no use for the external publication of their IC Statement as long as there are no internationally accepted concepts for IC and no standard definitions for the most important indicators. Meanwhile, the company continues to use IC Reporting to support business management.

Appendix J. References

- AIAF, 2002. Official Report n. 106, The communication of intangibles and intellectual capital: an empirical model of analysis, Milan
- Airtel-Vodafone Foundation, Madrid, and Zambon (2000), The strategic connotations of knowledge and intellectual capital: the new drivers of the internal and external company value, presentation delivered at the Business International Conference on “The value of intangible assets”, Milan, March.
- Alwert, K., Bornemann, M., Kivikas, M. . (2004) “Intellectual Capital Statement – Made in Germany; Guideline on the preparation of an intellectual capital statement”, The German Federal ministry of economics and labor, Berlin.
- Alwert, K., Heisig, P., Mertins, K. (2005), Wissensbilanzen-Intellektuelles Kapital erfolgreich nutzen und entwickeln, Springen, Berlin
- Andriessen, D. (2004), Making sense of Intellectual Capital – Designing a method for the valuation of intangibles, Elsevier Butterworth-Heinemann, MA, USA.
- Andriessen, D., Tissen, R., (2000), Weightless wealth: find your real value in a future of intangibles assets, Financial Times Prentice Hall, London.
- Arbeitskreis „Immaterielle Werte im Rechnungswesen“ der Schmalenbach-Gesellschaft für Betriebswirtschaft e.V. (2001), Kategorisierung und bilanzielle Erfassung immaterieller Werte, in: Der Betrieb, 19.
- ARC seibersdorf research GmbH (2002), “Intellectual Capital Report 2002- Knowledge shapes the future”, Seibersdorf, Vienna.
- Baldwin, J.R., Johnson, J. (1996), “Business strategies in more- and less-innovative firms in Canada”, Research Policy 25: 785-804.
- Ballot, G., Fakhfakh, F. and Taymaz, E. (2001): Firms' Human Capital, R&D and Performance: A study on French and Swedish Firms. Labour Economics, 8: 443-462.
- Bañegil, T.M. and R. Sanguino (2005) Informe sobre el Estado del Arte de la Gestión del Conocimiento en España. Grupo de Gestión de Empresas. Universidad de Extremadura. Working Paper 05/42001
- Bounfour A. (2003), The Management of Intangibles, The organisation's Most Valuable Assets, Routledge, London and New York.
- Bounfour, A, and Edvinsson, L (2005), IC For Communities, Nations, Regions, and Cities, Butterworth-Heinemann, Boston.
- Bounfour, A. (2005), “Modeling intangibles, transaction regime versus Community regime”, in: Bounfour A. , Edvinsson.L. (eds.), Intellectual Capital for Communities, Nations, Regions and Cities. Elsevier Butterworth-Heinemann, Boston, MA. Chapter 1.
- Bounfour, A.(forthcoming.) Knowledge resources, complementary assets and reporting.
- Canibano, L.; García-Ayuso, M.; Sánchez, P. (2000) Shortcomings in the measurement of innovation. Implications for accounting standard setting. Journal of Management and Governance, Vol, 4, n 4, pp. 319-342.
- Chaminade, C. and U. Johansson (2003) Can guidelines for intellectual capital management and reporting be considered without addressing cultural differences? Journal of Intellectual Capital, Vol 4, nº 4, pp 528-542
- Chiesa, V., Piccalunga, A. (1999) “The Birth of High-Tech Firms, Impresa & Stato”, No.43.
- Czarnitzki, D., Hussinger, K. (2004) “The Link Between R&d Subsidies, R&D Spending and Technological Performance”, ZEW Discussion Paper No. 04-56, Mannheim.
- Cordazzo M. (2005), "IC Statement vs. Environmental and Social Reports: An Empirical Analysis of their Convergences in the Italian Context", *Journal of Intellectual Capital*, Vol. 6, no. 3

- Di Tommaso M.R., Paci D. (2004), 'The Geography of Intangibles', in P. Bianchi, S. Labory, *The Economic Importance of Intangibles*, Aldershot: Ashgate.
- Dodgson, M., Bessant, (1996) *Effective Innovation Policy. A New Approach*, International Thomson Business Press.
- Edvinsson, L (2002), *Corporate Longitude-Navigating the Knowledge Economy*, Book House Publishing, Sweden
- Edvinsson, L., and Malone, M.S. (1997), *Intellectual Capital: realizing your company's true value by finding its hidden brainpower*, Harper Business, New York.
- Edvinsson, L., Richtner, A. (1999) "Words of value- giving words to IC", Skandia.
- ENSR (2002) Enterprise Survey
- European Commission (1997), "Second European Report on S&T Indicators", Luxembourg.
- European Commission (2000), *The European Observatory for SME – Sixth Report*, Luxembourg.
- European Commission (2002) "Observatory of European SMEs 2002, no. 6, High-tech SMEs in Europe", Luxembourg.
- European Commission (2003 a) "Observatory of European SMEs 2003, no. 2, SMEs and access to finance", Luxembourg.
- European Commission (2003 b), *Observatory of European SMEs. Highlights from the 2002 Survey*, ENSR Enterprise Survey 2002, Brussels
- European Commission (2003 c), *Third European Report on Science and Technology Indicators*.
- European Commission (2003d) "Observatory of European SMEs 2003", No. 8. Highlights from the 2003 Observatory, Brussels.
- European Commission (2004a), *European Innovation Scoreboard 2004*.
- European Commission (2004b), *Innovation in Europe – results for the EU, Iceland and Norway*.
- EVCA (2002), *The Survey of the Economic and Social Impact of Venture Capital in Europe*.
- German Accounting Standards Committee (2002), *GAS 12 Non-current intangible assets*, Berlin.
- Gray, C. (1997), *Managing Entrepreneurial Growth: A question of Control?* in: Deadkins et al. (eds.), *Small Firms: Entrepreneurship in the Nineties*, Paul Chapman, London.
- Hand J., Lev. B. (2003), *Intangible Assets- values, Measures, and Risks*, Oxford University Press, New York.
- IFKA (The Institute of Market Trends) (2002), *The Danish Supply of Courses – Upgrading of Competences in the Private Sector*, Copenhagen.
- Johanson, U & Backlund, A, "Can health be subject to management control?" *Textbook on Stress*. Eds.; Bengt B. Arnetz & Rolf Ekman, Wiley. Forthcoming
- Kaplan, R.S, Norton D.P. (1996), *The Balanced Scorecard: Translating Strategy into Action*, Harvard Business School Press, Boston, MA.
- Koch, G; Leitner, K.H.; Bornemann, M. (2000) *Measuring and Reporting Intangible Assets and Results in a European Contract Research Organisation*. Joint German-OECD Conference, Section on Benchmarking Industry-Science Relationships, Berlin,
- Laursen, K., Foss, N.J., (2000), "New HRM Practices, Complementarities, and the Impact on Innovation Performance", Working Paper, Department of Industrial Economics and Strategy, Copenhagen Business School.
- Leitner, K.H, Warden C. (2003), "Managing and reporting knowledge-based resources and processes in research organisations: specifics, lessons learned and perspectives", Elsevier/ *Management Accounting Research*, Vol 15, pp. 33–51
- Leitner, K.H. (2005) "Managing and reporting intangibles assets in Research Technology Organisations", *R&D Management*", Vol 35 No 2, pp. 125-136
- Lev, B. (2001), *Intangibles*. Brookings Institution Press, Washington, D.C.

- MERITUM (2002), Canibano, L. Garcia Ayuso, M. Sanchez, P. Chaminade, C (Eds) Guidelines for managing and reporting on intangibles (Intellectual Capital Report), Airtel-Vodafone Foundation, Madrid. Available at: www.uam.es/meritum
- METI (2004), Ministry of Economy, Trade and Industry, Reference Guideline for Intellectual Property Information Disclosure: In the pursuit of Mutual Understanding between Companies and Capital Markets through Voluntary Disclosures of Information on Patent and Technology. Available at: <http://www.meti.go.jp/english/information/downloadfiles/cIPP0403e.pdf>
- METI (2005), Ministry of Economy, Trade and Industry, Guidelines for Disclosure of Intellectual Assets Based Management. Available at: http://www.meti.go.jp/policy/intellectual_assets/GuidelineforIAM.pdf
- Michie, J., Sheehan, M. (1999), HRM Practices, R&D Expenditure and Innovative Investment: Evidence from the UK's 1990 Workplace Industrial Relations Survey, *Industrial and Corporate Change* 8: 211-234.
- Mouritsen, J. (2001), IC and the Capable Firm, Copenhagen Business School.
- Mouritsen, J., Bukh, p., Kaasgaard B. H. (2005), Understanding Intellectual Capital in an Innovative Medium-sized Firm: The Case of Maxon, The Aarhus School of Business, Copenhagen.
- Mouritsen, J., et.al. (2003 a), Analyzing Intellectual Capital Statements, The Danish Ministry of Science, Technology and Innovation. Copenhagen.
- Mouritsen, J., et.al. (2003), Intellectual Capital Statements - The New Guideline, The Danish Ministry of Science, Technology and Innovation, Copenhagen.
- Mouritsen, J., Larsen, H.T. & Bukh, P.N. (2001a) Reading Intellectual Capital Statements: Describing and Prescribing Knowledge Management Strategies, *Journal of Intellectual Capital* Vol.2, no. 4, pp. 359-383
- NIF-The Nordic Industrial Fund (2003) "Nordic harmonized knowledge indicators- Harmonized guidelines for IC Reporting in the Nordic IT industry", NIF, Copenhagen.
- Normann, Ramirez, R. (1999), *Value Constellations*, Blackwell.
- OECD (2002, 6th edition) "Frascati Manual 2002; Proposed Standard Practice for Surveys on Research and Experimental Development." OECD Publications, Paris, France.
- OECD/European Commission - Eurostat (1997, 2nd edition) "Proposed guidelines for collecting and interpreting technological innovation data – Oslo Manual, The Measurement of Scientific and Technical Activities." OECD Publications, Paris, France.
- PIP Project -Putting IC into Practice (2004 version 2), The selected indicators, Nordisk Innovations Center.
- Prince, Y. (1998) 'De innovativiteit van de Nederlandse industrie', [Innovation capacity in the Dutch industry], EIM reports.
- Romer, P. (1990): Endogenous Technical Change. *Journal of Political Economy*, 98, 5: pp71-102.
- Roos, G., Roos, J., Dragonetti, N., and Edvinsson, L. (1997), *Intellectual Capital: navigating in the new business landscape*, University Press, New York: New York.
- Rothwell, R. and Dodgson, M. (1989) 'Technology-based small and medium sized firms in Europe : the IRDAC results and their public policy implications', *Science and Public Policy*, Guildford, Vol. 16, No. 1, Feb. 1989, pp. 9-18.
- Rübig, P. (2005) "SMEs on their way to Lisbon", *The European Enterprise Journal* -A publication of the European Enterprise Institute, No 2, pp. 12-13
- Society for Knowledge Economics (2005), *Australian Guiding Principles on Extended Performance Management; A Guide to Better Managing, Measuring and Reporting Knowledge Intensive Organisational Resources*.
- Subcommittee on Management & Intellectual Assets (2005), Interim Report by Subcommittee on Management & Intellectual Assets, New Growth Policy Committee, Industrial Structure Council, Japan. Available at: http://www.meti.go.jp/policy/intellectual_assets/english.htm

- Sullivan, P.H. (1998), Introduction to Intellectual Capital management, John Wiley & Sons, NewYork.
- Sveiby, K.E. (1997), The New Organizational Wealth: Managing and Measuring Knowledge-Based Assets, Berrett-Koehler, San Francisco.
- Teece, D. (1987), "Profiting from technological innovation: implications for integration, Collaboration, Licensing and Public Policy", in : "The Competitive Challenge: Strategies for Industrial Innovation and Renewal, D.J. Teece (ed.), Ballinger, Cambridge, MA.
- Teece, D. (2000), Managing Intellectual Capital, Oxford University Press. Oxford.
- TERSTI (2003), Third European Report on Science & Technology Indicators 2003, DG Research, European Commission.
- UNESCO (1978), Recommendation Concerning the International Standardization of Statistics on Science and Technology, Paris.
- University Organisation and Studies Act (Universities Act 2002), University Organisation Amendment Act and Universities of the Arts Organisation Amendment Act, No. 120/2002 / 9th August, 2002, National Council of the Republic of Austria.
- Wall, A., Kirk, R., Martin, G. (2004), Intellectual capital- Measuring the immeasurable, Elsevier, Oxford, UK.
- Wallison, Peter J. (2004) The New Republic, December 20, 2004.
- Wissenskapital (2003), Future culture and earnings capabilities of Celle Technology Center, Wissenskapital Edvinsson & Kivikas Entwicklungsunternehmen, Oberreichenbach.
- Zambon S. (ed.) (2003), *Study on the Measurement of Intangible Assets and Associated Reporting Practices*, prepared for the "Enterprise" Directorate General of the European Commission, April, Brussels, available at:
http://europa.eu.int/comm/enterprise/services/business_related_services/policy_papers/brs/intangiblesstudy.pdf