



European Commission

Asia-Link Programme

Sustainable Program on Intellectual Capital Education

Key Course Text 1.2 The Intellectual Capital Perspective

Version September, 2006

Drs Christiaan Stam MBA

**Centre for Research in Intellectual Capital
INHOLLAND University of Professional Education**

Contact: christiaan.stam@inholland.nl

TABLE OF CONTENTS

•	PART 1: MANAGING BUSINESS STRATEGIES	3
1.2	The Intellectual Capital Perspective	3
1.1.	Learning objectives	3
1.2.	Different theories on competitive advantage	3
1.3.	Intellectual Capital	14
1.4.	Intellectual Capital: the next phase?	33
1.5.	Lessons Learned	35
1.6.	Suggested Reading	36
1.7.	Literature	37

PART 1: MANAGING BUSINESS STRATEGIES

1.2 The Intellectual Capital Perspective

One of the characteristics of the knowledge economy is that the economy has become more and more intangible. Almost 80 percent of the economic product is based on (intangible) services. Organizations have become virtual networks that mainly produce ideas and employees have become knowledge workers whose main responsibility is to process knowledge. As part of this transition emerged a knowledge-based view of the firm as a basis for what we call “the intellectual capital perspective”. This paragraph introduces the knowledge-based view and the intellectual capital perspective.

1.1. *Learning objectives*

The main objective of this paragraph is to introduce the concept of intellectual capital. Sub-objectives are to:

- Introduce different theories on competitive advantage
- Provide a definition of intellectual capital
- Give a historic overview of the intellectual capital movement
- Introduce a proposed framework for measuring and managing intellectual capital

1.2. *Different theories on competitive advantage*

During the past decade a *knowledge-based view* of the firm emerged. The knowledge-based view of the firm is based on the assumption that firm-specific knowledge has become the most important source of sustainable competitive advantage. Different theories on competitive advantage are:

1. Industry-based view
2. Resource-based view
3. Knowledge-based view

This section gives an overview of these different theories of competitive advantage. The main differences between these theories lie in their so called “strategic reference points” (Zegveld, 2000: pp.212-213). Whereas the first theory uses the external (competitors, suppliers, customers) as starting point for strategy development, the second uses the internal (organization, competences) as starting point. The knowledge-based view should be seen as a further specification of the resource-based view.

1.2.1. *Industry based view*

The main contribution to the industry-based view of the firm comes from Michael Porter. Therefore this paragraph focuses on his work. According to Porter “the essence of formulating competitive strategy is relating a company to its environment” (Porter, 1980). The structure of the industry determines the strategic options as well as the competitive rules of the game. “Since outside forces usually affect all firms in the industry, the key is found in the differing abilities of firms to deal with them”. In his book *Competitive Strategy*, Porter introduced a framework of five basic competitive forces. It is the collective strength of these

five forces that determines the relative competitive strength and the profit potential.

Rivalry between established competitors is usually the strongest of the five forces. As we know from marketing, competition can be based on price, product features, service, geographical focus or promotional activities. Second important competitive force is the *bargaining power of buyers*. Retailers and industrial buyers usually have strong purchasing power. Opposite to the power of buyers is the *bargaining power of suppliers*. According to Porter this is the weakest of the five forces. For various reasons it might be attractive to a company to *enter a market*. This might be achieved by acquisition, collaboration or starting to provide the product or service itself. The final competitive force comes from *substitute products*. Changes in the environment or radical innovations might make initially different products competing with each other. These five forces are the main factors that can potentially have an impact on industry competition. However, not all forces will be equally important. The five-forces model can be used to identify the features that determine the nature of competition in a particular industry.

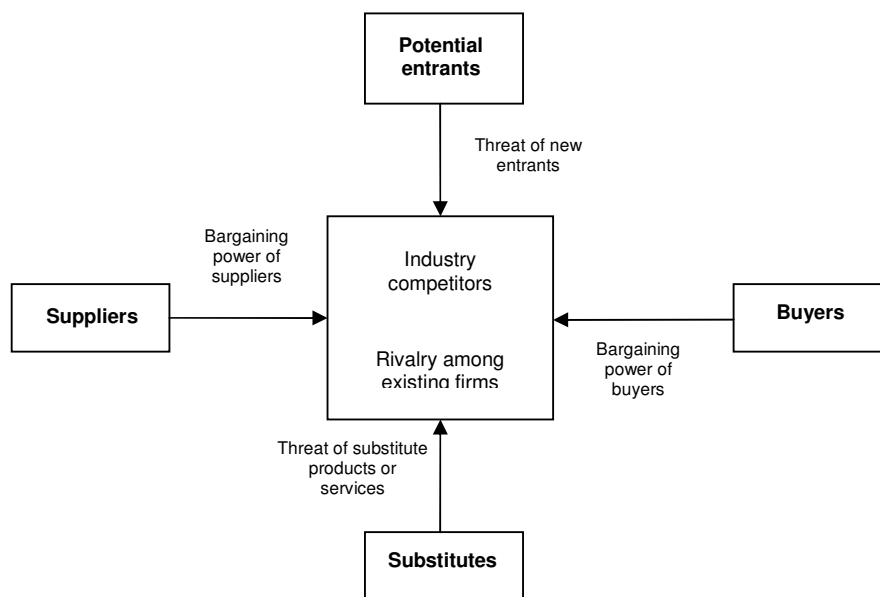


Figure 1.2.1: Forces Driving Industry Competition, (Porter, 1980)

In addition to this, Porter developed a prescriptive model which provides a set of generic strategies to follow depending on the position of the company's product on a matrix. The answers to two questions provide the axes for the matrix:

1. Does the firm seek to gain advantage by being low cost or differentiated?
2. Does the firm seek to serve a number of segments or to focus on a few?

		Strategic advantage	
		Differential	Low Cost
Strategic target	Multi-segment	Differentiation	Cost leadership
	One particular segment	Differentiation focus	Low cost focus

Figure 1.2.2: Generic competitive strategies, (Porter, 1980)

According to Porter we can distinguish three 'generic strategies':

1. *Cost leadership* aims at becoming the lowest cost producer by emphasizing the need for both tight cost control and the continuous search for cost reductions.
2. *Differentiation* aims at creating extra value-added through investments in product development.
3. *Focus* strategy does not only aim at low-cost or value-added, but also at one or several particular segments within the industry.

In addition to these three generic strategies, there is a fourth strategy: *Stuck-in-the-middle* (between Low cost and Differentiation). According to Porter a company has to choose between one or the other and he rejects the possibility of choosing both. However, many products and services are not only bought on price. Often consumers take many factors into account and price is only one of them. Therefore, the absolute distinction between low-cost and differentiation does not represent an adequate approach anymore.

Limitation of Porters Five Forces Model is that environments that are characterized by rapid, systemic and radical change require more flexible, dynamic or emergent approaches to strategy formulation (see: disruptive innovation). Another important limitation of Porter's Five Forces Model is that it easily leads to an underestimation of the strengths of the organization. The resource-based view can be seen as an answer to these limitations.

"Through the World Wide Web (WWW) mobile communications and other technological breakthroughs companies are able to choose more than one of the generic strategies. Computer producer Dell's built-on-demand strategy is a good example of a company being able to capitalize on the advantages of mass-customization achieving significant economies of scale. In other words, Dell can pursue the strategies cost leadership and differentiation simultaneously while still serving the mass market. Hence it is not sufficient anymore to solely focus on the external environment of a company as there is an urge to take internal factors into consideration that were neglected before" (Behn, 2000).

The value of Porter's industry-based view is that he developed an 'outside-in' strategy process. His different models support management to navigate through this process (Zegveld, 2000). The competitive forces model and SWOT-analysis can be used to select a domain within the industry. The generic competitive strategies can be used to select a competitive position within the industry. Finally the value chain can help translate strategy into action by selecting resources and the required activities.

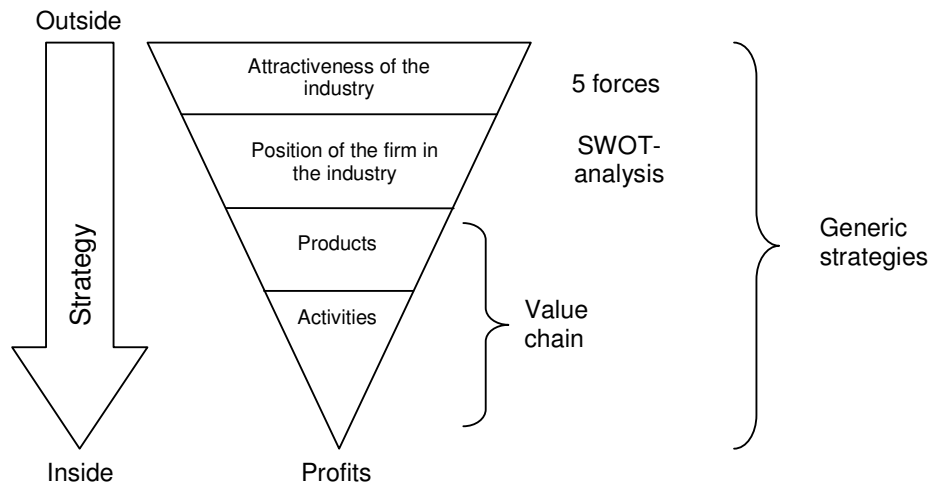


Figure 1.2.3: Outside-in strategy process, Zegveld, 2000

1.2.2. Resource-based view

During the past decades a *resource-based view* of the firm emerged. The resource-based view of the firm is based on the assumption that firm-specific competencies have become the most important source of sustainable competitive advantage. The traditional competitive environment was stable and transparent. It was characterized by clear defined markets, customers and competitors. Today's competitive environment however, is characterized by dynamic changing markets and fast changing customer demands. More and more competition has become the ability to anticipate these changes and thus asks for a more dynamic strategic approach as an alternative to the traditional industry-based, competitive advantage view.

Core competencies

Hamel and Prahalad (Prahalad & Hamel, 1990; Hamel & Prahalad, 1994) are probably the most influential advocates of the resource-based view. Therefore, this section focuses on their work. The main message of Hamel and Prahalad is that not the relative position within the industry, but the firm's core competences determines competitive advantage. Core competencies are those distinctive skills and capabilities which taken together represent the firm's ability to do business better than its competitors. *"In the short run, a company's competitiveness derives from the price/performance attributes of current products (...). In the long run, competitiveness derives from an ability to build, at lower cost and more speedily than competitors, the core competencies that spawn unanticipated products. The real sources of advantage are to be found in management's ability to consolidate corporate wide technologies and production skills into competencies that empower individual businesses to adapt quickly to changing opportunities"* (Prahalad & Hamel, 1990: p.81). So core competencies are the main resources and can be seen as the collective learning in the organization. The ability to learn is a necessary precondition in order to be able to continuously adapt to changing customer demands. Within the resource-based view, the strategic reference point shifted from the external to the internal. Contrary to the industry-based view, the firm self became the main subject of investigation. In the long run, competitiveness is derived from the ability to build a Core Competence, at lower cost and more speedily than competitors.

Performance and Opportunity gap

According to Hamel and Prahalad, value creation is about managing the performance gap – quality, costs, productivity etc. – and the opportunity gap – developing resources to create

new businesses and markets. Identifying core competences is not just a matter of taking an inventory of skills and assets. A company can have many strengths, but only few will qualify as core competences. Three tests can be applied to internal strengths in order to isolate core competences (CC):

1. CC should provide access to a wide variety of markets.
2. CC should deliver significant contribution to perceived customer benefits.
3. CC are difficult for competitors to imitate.

To explain the concept of Core Competences, Prahalad and Hamel used the metaphor of a tree. The corporation, like a tree, grows from its roots. This metaphor is also used to explain the Intellectual Capital perspective. We will come back to this in the next paragraph.

Strategy as 'stretch' and 'leverage'

Important concepts in the contribution of Hamel and Prahalad are 'stretch' and 'leverage'. Stretch can be defined as 'doing the impossible' or where ambition outpaces resources. It requires a total commitment to achieve the desired goal which is communicated to and accepted by the whole workforce. Leverage is about getting the most out of resources. However, it focuses on using the resources to generate better effect rather than on reducing resources in terms of downsizing. Leverage can be achieved in five ways (Hamel & Prahalad, 1993: pp. 160-176; 1994):

1. Concentrating resources
2. Accumulating resources
3. Complementing resources
4. Conserving resources
5. Recovering resources

Where Porter warns for a stuck-in-the-middle position, Prahalad and Hamel warn that core competencies should not develop into core-rigidities. A core competence is difficult to learn, but is difficult to unlearn as well. Sometimes companies neglect new market circumstances or demands. They risk to be locked in by choices that were made in the past.

Building a Core Competence

A core competence is built through a process of continuous improvement and enhancement. According to Prahalad and Hamel the goal is to build world leadership in the design and development of a particular class of product functionality. Top managers can not just be another layer of accounting, but must add value by articulating the strategic architecture that guides the process of competence building. Here we recognize the roots of management topics like the *learning organization*, *intellectual capital* and *knowledge management*.

Inside-out strategic process

The outside-in approach places the market, the competition and the customer at the starting point of the strategic process. The Core Competence model does the opposite and starts the strategy process by thinking about the core strengths of the organization. "Resources are the factors for production and dictate the supply or the transformation process. This means that resources can be tangible as well as intangible, human as well as physical. The strategy process from a resource based strategic management perspective therefore has an 'inside-out' orientation (Zegveld, 2000).

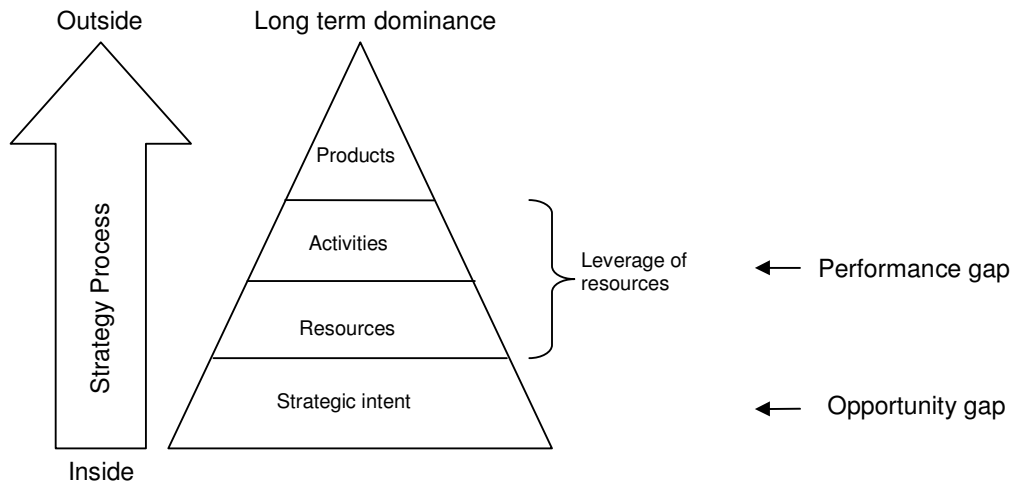


Figure 1.2.4: Inside-out strategy process, based on: Zegveld, 2000

Brand as competitive advantage

Recently Boeing Co. has taken up branding as an integral part of the company's strategy. These branding strategies may be nothing new to companies like Coca-Cola or Ford, but it is revolutionary for the stodgy aerospace industry. Boeing executives now realize that a strong brand helps recruit and retain quality employees, perks investor interest, and reflects well on the management team. "It goes hand in hand with your reputation," says Anne Toulouse, a Boeing veteran who took on the recently created post of vice-president in charge of brand management. "We see having a strong brand as a competitive advantage."

Source: *BusinessWeek*, August 6, 2001

People are the heart of our company

In 2002 Mail, Logistics and Express company TPG-TNT gave their annual report the above title. In his introduction, CEO Peter Bakker stated that "our people are the key determinant of whether we will be successful. Only their commitment and creativity will allow us to continue to beat our profit and value targets. Only their passion and pride will make us successful in the future."

Source: *TPG annual report, 2001*

The worlds most valuable brands

Every year Interbrand calculates the value of brands as an indicator of competitive power.

Rank	Brand	Value (\$blns)
1	Coca-Cola	67,5
2	Microsoft	59,9
3	IBM	53,4
4	GE	47,0
5	Intel	35,6
6	Nokia	26,5
7	Disney	26,4
8	McDonalds	26,0
9	Toyota	24,8
10	Marlboro	21,2

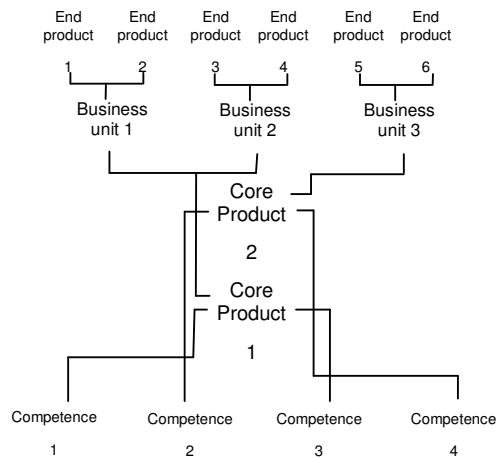
Source: *BusinessWeek*, July 2005

Question:

How does brand contribute to competitive advantage?

Corporation is like a tree...

The diversified corporation is a large tree. The trunk and major limbs are core products, the smaller branches are business units; the leaves, flowers, and fruit are end products. The root system that provides nourishment, sustenance, and stability is the core competence. You can miss the strength of competitors by looking only at their end products, in the same way you miss the strength of a tree if you look only at its leaves.



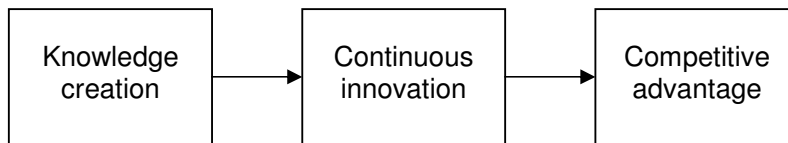
Source: *Prahalad & Hamel, 1990, p.82*

1.2.3. Knowledge-based view

The last decade, more and more authors have claimed that *knowledge* is the most important resource. “In an economy where the only certainty is uncertainty, the sure source of lasting competitive advantage is knowledge” (Nonaka & Takeuchi, 1997). Knowledge management literature can be seen as a further specification of the resource-based view into a knowledge-based theory of the firm. “To the extent that it focuses upon knowledge as the most strategically important of the firm’s resources, it is an outgrowth of the resource-based view” (Grant, 1996). Most important and fundamental difference is that the resource-based view only implicitly refers to knowledge, whereas the knowledge-based view gives extensive elaborations on the nature and definition of knowledge and the way it should be managed. The most influential contribution to the knowledge-based view comes from Nonaka and Takeuchi (Nonaka, 1991). Therefore, this paragraph focuses on their work.

Knowledge-based competition

Important contribution to the knowledge-based view was delivered by Peter Drucker. In his many publications since World War II he stressed the increasing importance of knowledge and the productivity of knowledge workers. Therefore, in *The post-capitalist society* (Drucker, 1993) he calls for the development of a new economic theory that puts knowledge in the centre of the wealth creating process. In a sense Nonaka and Takeuchi give content to this challenge with their theory of knowledge creation.



Source: Nonaka and Takeuchi, 1995

Figure 1.2.5: Knowledge creation as source of competitive advantage

Knowledge

Knowledge is a combination of human-related or *tacit* knowledge and non human-related or *explicit* knowledge (e.g.: Polanyi, 1974; 1983; Nonaka & Takeuchi, 1997). The former refers to everything that is related to, controlled by and dependent on the people within the organization. The latter refers to everything related to and controlled by the organization and not dependent on the people. Both elements are necessary but not sufficient. Tacit knowledge needs explicit knowledge, like human resources need non-human resources to create value for the company.

Knowledge creation

Based on the distinction between tacit and explicit knowledge, Nonaka and Takeuchi developed a so called *knowledge creation spiral*, which is the result of a continuous process of dynamic interactions between both types of knowledge. Within the process they make distinction between:

- Socialization
- Externalization
- Combination
- Internalization

In order to build sustainable competitive advantage, organizations should build company specific knowledge assets by managing the relevant knowledge processes. Chapter 3 (Managing knowledge processes) will go further into this subject.

Knowledge management strategies

In line with the two main dimensions of knowledge (tacit and explicit) we can distinguish two strategies for managing knowledge (Hansen et al., 1999).

1. Personalization strategy: knowledge is closely tied to the person who developed it and is shared mainly through direct person-to-person contacts. The chief purpose of computers within this strategy is to help people communicate knowledge, not to store it.
2. Codification strategy: knowledge is carefully codified and stored in databases, where it can be accessed and used easily by anyone in the company.

More and more we also see that organizations deliberately choose to combine these two strategies in company-wide Communities of Practice. CoP's usually combine direct and indirect knowledge exchange. The selection of one of these strategies has direct consequences for the measures and instruments that have to be taken. Chapter 3 will go further into this subject.

Knowledge-based strategy-process

Analogue to the resource-based strategy process, the knowledge-based strategy process is also 'inside-out'. Knowledge management is the process of designing, implementing and maintaining the knowledge infrastructure in order to support the leverage of knowledge resources. Chapter 3 will go into this subject in more detail.

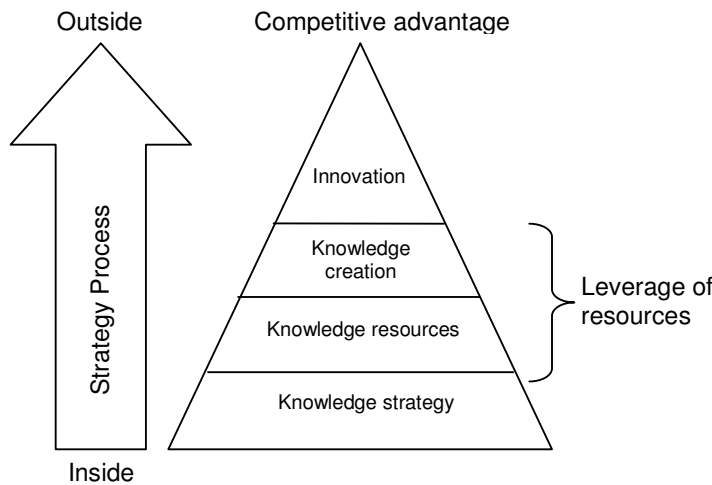


Figure 1.2.6: The knowledge-based strategy process

1.2.4. Resource-based view + knowledge-based view = intangible-based view

Parallel, and closely related, a more holistic perspective on the value creating resources of the organization emerged. This *intangible-based view* of the firm is based on the work of authors like Sveiby (1997), Stewart (1997) and Edvinsson and Malone (1997). This so called *Intellectual Capital* movement uses knowledge and intellectual capital interchangeably. Although closely related, the meaning of knowledge in this movement fundamentally differs from the definition of knowledge in the knowledge-based view of the firm. Intellectual capital, intellectual assets, intangible assets, intangibles, knowledge assets, knowledge capital or

whatever word is used within this movement, refers to the traditional hidden sources of value creation (of which knowledge is just one).

The intangible-based view can be characterized as a combination of the resource-based view and the knowledge-based view. It is closely related to the resource-based view, because they share the same holistic perspective on organizational resources. It is closely related to the knowledge-based view because they both make a distinction between human-related and non-human related resources.

Theory	Specification	Sources
Resource-based view	No specification of resources	Hamel & Prahalad
Knowledge management	Tacit and explicit knowledge	Nonaka & Takeuchi
Intellectual capital	Human and structural capital	Sveiby, Edvinsson, Stewart

Table 1.2.1: relationship between different topics

“The management of intangibles is broader than the management of knowledge. It involves the identification of intangibles linked to the present and future value of the firm, their measurement and finally, the implementation of those intangible activities that might be positively affecting the level of the critical intangibles, with the sole purpose of developing competitive advantages” (Sanchez et al., 2000: p.324). This *intangible-based view of the firm* inspired the intellectual capital movement to further elaborate on the nature of intangible resources and the way they should be measured and managed in order to create strategic awareness about the real sources of value creation. The next section elaborates on the intellectual capital movement.

Theory	Based on:	Description	Generic model
Industry-based view	Porter, 1980	Beat the competition (industry and key competitors)	Five forces
Resource-based view	Hamel and Prahalad, 1990	Build unique competences (firm-wide capabilities)	Core competence
Knowledge-based view	Nonaka & Takeuchi, 1991	Build unique knowledge	Knowledge creation

Table 1.2.2: Competitive advantage models

<p>A crucial asset</p> <p>“Knowledge is power”, wrote the English philosopher and politician Francis Bacon in the early seventeenth century. Knowledge is today’s hardest currency and – as trend researchers and management consultants tell us – tomorrow’s number one productivity factor. As varied and multifaceted as the term “knowledge” may seem, one thing is certain: In the future, intelligent knowledge management will afford companies a critical competitive advantage.</p> <p>Demand is growing constantly for knowledge-intensive services relating to all aspects of products, not least at Siemens: As a systems integrator and solutions house, the company has a wealth of experience and expertise to offer its worldwide customer base. Today, more than 50% of the value added at Siemens derives from knowledge-intensive services, and the trend is up.</p> <p>For Siemens knowledge has four central aspects: It adds value and creates benefits for customers; it is the raw material of innovations; it is the key to the global market; and it is our primary goal as a learning company.”</p> <p><i>Source: Siemens, Networking Knowledge</i></p>	<p>Strategy as if knowledge mattered</p> <p>Five principles for developing knowledge strategies:</p> <ol style="list-style-type: none"> 1. Knowledge-based strategies begin with strategy, not knowledge. 2. Knowledge-based strategies aren’t strategies unless you can link them to traditional measures of performance. 3. Executing a knowledge-based strategy is not about managing knowledge; it’s about nurturing people with knowledge. 4. Organizations leverage knowledge through networks of people who collaborate – not through networks of technology that interconnect. 5. People networks leverage knowledge through organizational “pull” rather than centralized information “push”. <p><i>Manville and Foote (1996), in FastCompany.</i></p>
---	---

1.3. Intellectual Capital

At the end of the 20th century a new perspective on value creation emerged: Intellectual Capital. This new perspective was grounded in several developments which were closely related to the characteristics of the New Economy (see previous paragraph).

The first and main reason for the rise of this topic comes from a wide-spread dissatisfaction with the 500 year old accounting system. Already in the 1980's Karl-Erik Sveiby warns for the danger of this money-driven system, because financial indicators can give misleading signals about knowledge-intensive companies as long as the maintenance of intangibles can not be treated as investments. "Profitability, or return on capital, is misleading. If it turns out to be the result of a failure to invest in the maintenance and expansion of the know-how capital it may be a sign that something is going wrong" (Sveiby & Lloyd, 1988). The second explanation for the rise of Intellectual Capital as a management topic comes from the increasing difference between market- and book value. The huge rise of stock prices led to a marginalization of the explanatory power of the traditional balance sheet. An increasing part of the value of listed companies could not be explained. This in combination with an increasing number of private investors led to the awareness that something had to be done to explain the huge difference between market value and book value. A third explanation, closely related to the second was the effect of globalization and increasing need for transparency in business reporting. More and more organizations start doing business abroad. Different accounting principles make it difficult to compare and consolidate results and performance figures. Intellectual Capital measurement is an attempt to build a standardized performance framework. Other related reporting topics are the Balanced Scorecard, Corporate Governance and Corporate Social Responsibility. The fourth explanation for increased interest in Intellectual Capital is the ICT-hausse at the end of the 1990s. The Y2K-problem and the introduction of the Euro forced many companies to invest heavily in their ICT-infrastructure. After the dust had fallen down, companies discovered that they had bought applications with much more possibilities than before. Intellectual Capital and other reporting initiatives can be seen as an intelligent way of exploiting the new ICT infrastructure.

In the previous section we argued that Intellectual Capital is closely related to the *resource-based view*. Which of course is still true, however, the main and distinguishing difference is that Intellectual Capital explicitly focuses on intangible resources. Like the knowledge-based view, Intellectual Capital gives content to the concept of *core competences* and narrows its focus on those resources which are considered most important for creating competitive advantage.

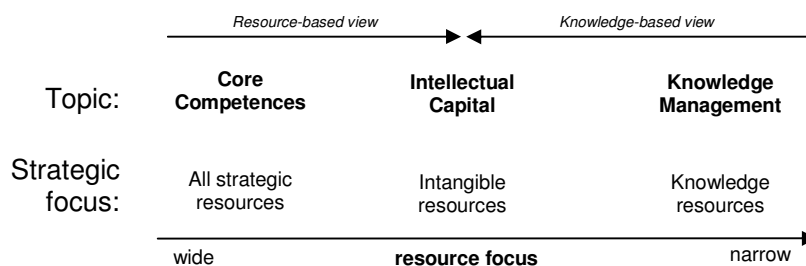


Figure 1.2.7: Strategic focus of different management topics

Intellectual Capital is based on the belief that the main resources for building competitive advantage are intangible resources. However, as a result of the traditional bookkeeping system, these resources are not being monitored. Therefore we do not know their value and performance, which leads to poor valuation (external communication problem) on the one

hand and poor usage (internal management problem) on the other hand. The belief is that systematic and standardized reporting about intangibles, both internal and external, will lead to better organizational performance.

1.3.1. Defining IC

Intellectual capital management is the concept of identifying, measuring and managing intangibles. After more than a decade, the term intellectual capital counts for numerous interpretations and definitions. This divergence can be explained by the fact that the field is still in its 'embryonic stage' (2002). Andriessen (2004) adds to this that each author just wants 'to convey a specific message that he thinks is important' (p.62). Some authors stress in their definition the importance of value creation (Edvinsson, Stewart); others stress the importance of value extraction (Sullivan). Some focus on knowledge (Stewart), others on intellectual properties (Brooking). Some use it as a synonym for 'core competencies' (Andriessen, Viedma), others translate it as a 'capacity-to-act' (Sveiby). However, these differences do not mean that their definitions are excludable. Despite the differences, we also see a lot of agreement about the nature of intellectual capital. Core-elements of agreement are:

- *Intellectual capital is about intangibles.*
An intangible is something which is 'hidden or not-material', which is 'difficult to understand' and which 'cannot be known by the senses', although 'it is known to be real' (Longman Dictionary). Intellectual capital gives intangibles an object¹, so that they can be recognized and understood.
- *Intellectual capital makes the difference.*
As described above, intellectual capital is a further specification of the resource-based view of the firm. Starting point of this intangible-based view of the firm is that intangibles are the main source of value creation and competitive advantage. Intellectual capital is about exploiting intangibles.
- *Intellectual capital gives structure to organizational resources.*
Recognizing the importance of intangibles is one thing, but translating it into a theory is another. Intellectual capital is the movement that gives content to the challenge expressed by Drucker (1993) that we need a theory that puts knowledge (intangibles) into the centre of the wealth creating process. Moreover, intellectual capital makes it possible to communicate, interpret and control intangibles.
- *Intellectual capital is about human-, and non-human resources.*
Intellectual capital represents a holistic view of the firm. It is not only about the people (like Human Resource Accounting), but also about the non-human intangible resources, like organizational processes, structures, systems. Intellectual capital goes 'beyond the brain' (Andriessen, 2004: p.60).

So, the word intellectual capital should not be taken too literally. Intellectual capital is a metaphor, because it describes the importance of all the intangible resources by stating the ability to use the human mind (intellectual) and financial wealth (capital), with which it can be compared. It is not only about the ability to use the human mind or financial wealth. In fact, the word *intellectual* goes beyond the brain and *capital* goes beyond finance.

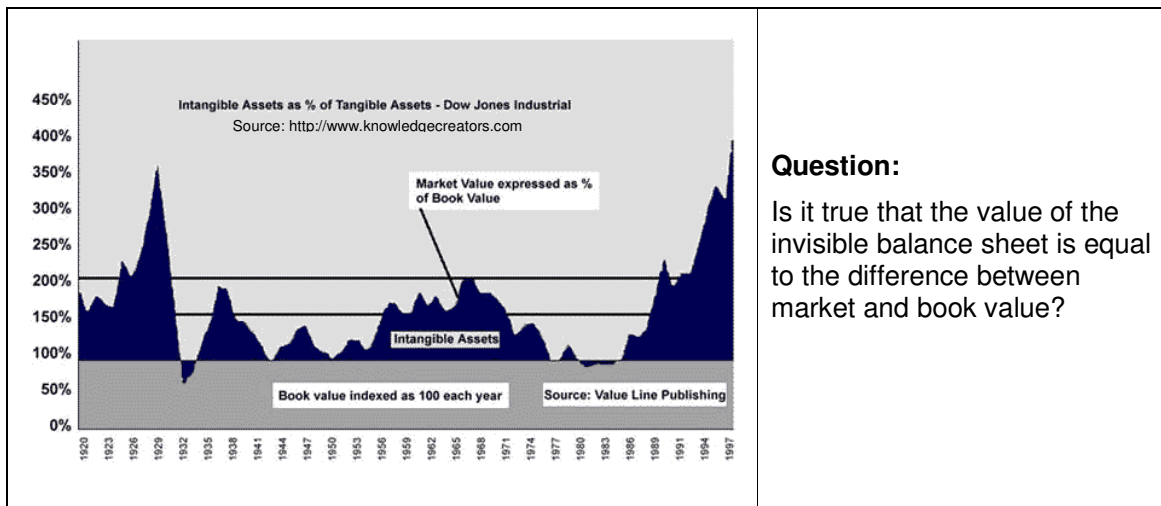
The word *intellectual* refers to intangibles in general. It refers to both human- and non-human resources. So, it is not only about the people, their knowledge and skills, but also about organizational processes and relationships with the customers. The word *capital* refers to financial wealth. However, the essence of the phrase intellectual capital refers almost to the

¹ Mouritsen, J., Designing and interpreting intellectual capital statements. Presentation at IC-congress "Interpretation and communication of intellectual capital, Hanken Business School, 2-3 September 2004, Helsinki Finland.

opposite. Intellectual capital goes beyond the traditional accounting principles. It is no longer relevant whether resources can be expressed in monetary terms or not. Moreover, it is also no longer relevant whether an asset is owned by the organization or not. What matters is whether the resource is available or not. Does the company have access to it in order to realize its strategic goals? That is the main qualifying characteristic.

The phrase intellectual capital also makes a strong reference to the word ‘important’ or ‘strategic’. The literal meaning of both words refers to the importance of the ‘head’. If we look at the meaning of the word capital in the dictionary it often distinguishes the important from the ordinary (e.g. capital city, capital punishment, capital letters, capital importance). In business language important is frequently translated by ‘strategic’. In this sense intellectual capital refers to intangibles that are of strategic value to the company. Strategic in the sense that they contribute to the creation of organizational value and the achievement of organizational goals. In other words, intellectual capital is about strategic intangible resources.

Based on the above we would define intellectual capital as *all intangible resources that are available to an organization, that give a relative advantage, and which in combination are able to produce future benefits.*



1.3.2. History of IC movement

The fundamentals of Intellectual Capital are not new. Based on the idea that knowledge is an important resource and a powerful engine of production, Alfred Marshall introduced the concept of *Residual Income* (RI) in the 1890s. Also closely related is the French *Tableau de Bord* which was developed in the 1930s. As a result of the division between financial management and management accounting, managers did not have access to financial performance measurements. In order to get more information about the performance of the organization, they developed a scorecard as a basis for managerial decision making. Another Intellectual Capital topic “avant-la-lettre” was Human Resource Accounting (HRA), which emerged in the 1960s. HRA was meant to be complementary to the traditional accounting methods. Starting point was that people represented a large part of the value of a company and thus, information about people is essential for decision making. Finally, and very closely related to IC, in 1980 Hiroyuki Itami published his book *Mobilizing Invisible Assets*, a quest for the Japanese success after World War II. In his quest, Itami finds out that the main sources of competitive advantage were hidden in invisible assets.

The roots of today's intellectual capital movement lie in the mid 1980s in the work of the Konrad Group and Karl-Erik Sveiby. However, it was Leif Edvinsson and Thomas Stewart who, fuelled by the power of popular communication, gave the movement a rocket launch in the mid-nineties. In a series of publications in Fortune magazine Thomas Stewart really put the topic on the management agenda. These articles were followed by several books with the same title: Intellectual Capital.

<i>Year:</i>	<i>Author:</i>	<i>Title:</i>
1986	Sveiby	<i>The Know-How Company</i>
1988	Sveiby	<i>The New Annual Report (Konrad report)</i>
1989	Sveiby	<i>The Invisible Balance Sheet</i>
1991	Stewart	'Brainpower', in: <i>Fortune</i>
1994	Stewart	'Intellectual Capital', in: <i>Fortune (cover article)</i>
1996	Brooking	<i>Intellectual Capital: Core Asset for the Third Millennium Enterprise</i>
1997	Sveiby	<i>The New Organizational Wealth: Managing & Measuring Knowledge-based Assets</i>
1997	Edvinsson and Malone	<i>Intellectual Capital: The proven way to establish your company's real value by measuring its hidden brainpower</i>
1997	Stewart	<i>Intellectual Capital: The new wealth of organizations</i>
1997	Roos et.al.	<i>Intellectual Capital: navigating in the new business landscape</i>
1998	Sullivan	<i>Profiting from Intellectual Capital</i>

Table 1.2.3: Short history of Intellectual Capital publications

1.3.3. Karl-Erik Sveiby: the invisible balance sheet

The Swedish accountant, Karl-Erik Sveiby experienced the shortcomings of the traditional bookkeeping system. His warning about these shortcomings were taken seriously and resulted in the first guideline – The New Annual Report - for reporting about intangible assets (Sveiby did not use the term Intellectual Capital at that time). Since then, dozens of Swedish companies have reported about their intangibles annually.

Managing Know-how

Although relatively unknown, Sveiby played an important role in establishing the knowledge-based view of the firm. His book *Managing Know-how* (1986) describes a new kind of organization in which know-how capital has become more important than financial capital. An important characteristic of know-how companies is that they treat knowledge like 'normal' resources. However, the traditional accounting system hinders them to do so, because it does not allow organizations to depreciate investments in knowledge. Therefore, key financial indicators, as taught at business school, can be dangerously misleading. "Profitability, or return on capital, is misleading. If it turns out to be the result of a failure to invest in the maintenance and expansion of know-how capital it may be a sign that something is going wrong. (...) They may be milking their invisible balance sheet." (Sveiby & Lloyd, 1988: p.70).

Konrad-group

Sveiby's statements in *Managing Know-how* were taken seriously and led to the establishment of the Konrad-Group (named after the patron Saint of the day that they presented their report). Aim of the Konrad-Group was to improve external reporting, in order to better reveal the real value of organizations. This resulted in the publication of *The New*

Annual Report (Konrad-group, 1988) and *The Invisible Balance Sheet* (Sveiby, 1989) in which a model was presented for reporting about intangible assets. In these publications the terms 'human capital' and 'structural capital' were launched as main subsets of intangible assets. In 1994 43 Swedish companies measured and reported their intangible assets according to the Konrad model, including WM-data, Skandia, TurnIT, and AFS.

The invisible balance sheet

One of the main contributions of Sveiby is that he created awareness that the accounting system provides a limited view on organizational value, because it does not reveal the most important resources: intangible assets. If we want to reveal these intangibles, we should seek for the so called invisible balance sheet.

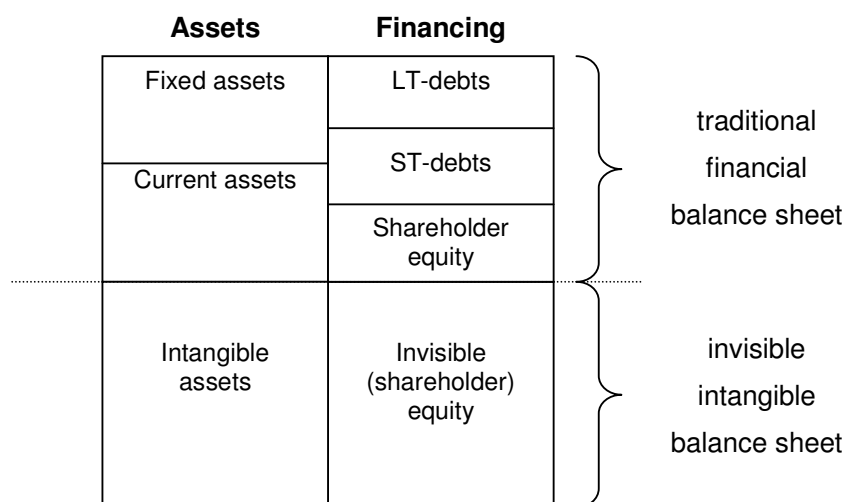


Figure 1.2.8: The invisible balance sheet, (Sveiby, 1997)

The traditional financial balance sheet shows the companies assets at the left hand side and the way these assets are financed at the right hand side. Sveiby argued that this balance sheet does not take account of intangible assets, which are invisible or hidden for the (financial) eye. The size of the invisible balance sheet is best illustrated by listed companies (see figure Dow Jones Industrial above). However this does not mean that only listed companies have invisible balance sheets.

The Dow Jones graph shows that there have always been differences between market and book value. Usually market value is been higher than book value. Exceptions are the Great Depression in the 1930s and the crises in the 1970s and 1980s. The Dow Jones graph also shows that during the 1990s the differences between market and book value grew out of hand. More and more organizations had difficulties with explaining and justifying their market capitalization, which led to some painful experiences at the height of the new economy.

In a sense the intellectual capital movement can be seen as a quest for structuring intangible assets, inspired by the double-entry bookkeeping system.

Intangible Assets Monitor

In order to help organizations explain and justify the difference between market and book value, Sveiby developed the *Intangible Assets Monitor* (IAM). Within this monitor he makes a distinction between three different kinds of intangibles (Sveiby, 1997):

1. *Individuals Competence* involves the capacity to act in a wide variety of situations to create both tangible and intangible assets. It is about skills, education, experience

and employee attitude. They are the most important assets, because all other assets are created by employees.

2. *Internal Structure* includes patents, concepts, models, and computer and administrative systems. They are created by the employees, but are generally owned by the organization. In other words: Internal Structure is the organization.
3. *External Structure* includes relationships with customers and suppliers. It also encompasses brand names, trademarks, and the company's reputation or image. Some of them can be seen as legal property of the organization.

This initial distinction of intangibles appeared to be very solid and is widely accepted as a basis for an emerging standard (see below). However, according to Sveiby, the distinction between these three different types of intangibles alone was not enough. In order to stress the importance of several universal attributes of an organization he added three different kinds of perspectives with which the different kinds of intangibles could be analyzed. The acceptance of these perspectives has been far less than the acceptance of the different types of intangibles.

1. **Growth/Renewal**
These measurements are an indicator of change. Usually expressed in terms of investments.
2. **Efficiency**
These measurements are an indicator of productivity of the company as a whole and specific types of employees in particular (e.g. support staff, fee-earners, etc.).
3. **Stability**
These measurements are an indicator of risk in terms of knowledge and experience and can be seen as a contra-indicator of growth and renewal.

Together the three types of intangibles and three different perspectives add up to a 3x3 matrix. The idea is that each cell contains several indicators. The indicators will differ per organization, because they are derived from strategic goals, which differ per organization. In his book *The New Organizational Wealth* (Sveiby, 1997) he gives a large amount of possible indicators, however each cell should not contain more than two or three indicators, because the power of the model is in its simplicity.

	Individuals' competence	Internal Structure	External Structure
Growth/renewal			
Efficiency			
Stability			

Figure 1.2.9: Sveiby's Intangible Assets Monitor (Sveiby, 1997)

The introduction of the Intangible Assets Monitor in the early 1990s led to some discussion about the 'accounting' method and the value of these kinds of measurements. However, in practice this did not appear to be the real problem. The real problem appeared to be the strategic transparency. In this sense, the biggest strength of the model also appeared to be its biggest weakness, because organizations did not want to provide this much strategic and operational openness. However, the appointment of Leif Edvinsson as Director of Intellectual Capital and the publication of the Skandia Intellectual Capital reports, positively contributed to the acceptance of Sveiby's ideas about intangible reporting.

The work of Sveiby since the mid-eighties has been really ground breaking. His ideas can be seen as an important contribution to the establishment of the knowledge-based view of the firm. Moreover, his publications appeared to be pioneering in two major management topics: *knowledge management* and *intellectual capital*, and his conceptual frameworks inspired

the intellectual capital movement in particular, first in Sweden and later globally. The global distribution, however, was taken over by Leif Edvinsson and Thomas Stewart. The successes of the Skandia-case and the inspiring articles in Fortune Magazine at the beginning of the 1990s have put Sveiby to the background.

Celemi

Probably the best illustration of the application of Sveiby's Intangible Assets Monitor is the Swedish consultancy firm Celemi ab. Supported by learning simulations like Mando™ and Tango™, Celemi helps other organizations to reveal the intangible sources of value creation. Since 1995 Celemi publishes an IAM as a part of their financial report.

Celemi's 'Invisible' Balance Sheet contains intangible assets that can be classified under three main headings:

- *Our Customers* are an external structure of relationships with customers and suppliers, brand names, trademarks and reputation or image. This structure is constantly being created by Celemi's employees. The value of customer relations is primarily influenced by how well Celemi solve customers' problems. Some of these structures are Celemi's legal property, but most bonds are not so strong because investments in customer relationships cannot be made with a full degree of confidence.
- *Our Organization* is a corporate internal structure consisting of patents, concepts, models, and computer and administrative systems, including general management. Also this structure is a creation by Celemi's employees and its components are generally owned by Celemi. Decisions to develop or invest in the organization can be made with some degree of confidence, because the work is done in-house, or bought from outside.
- *Our People* is the combined competence of Celemi's employees, such as their ability to act in a wide variety of situations. The value of people is that they are the only true agents in business; all assets and structures, whether visible or invisible, are the result of human action and depend on people's competence and energy for their continued existence. People are however not a corporate "asset" like the two structures above, because people can not be owned.

Even if the value of intangible assets in money terms can only be estimated with a great degree of uncertainty, Celemi's Invisible balance sheet is much larger than the 'visible' one. What is of great interest to know for Celemi's stakeholders is therefore whether the intangible assets are increasing in value and whether they are utilized efficiently. This can be determined with more certainty, and this is the aim of Celemi's Intangible Assets Monitor.

Source: Celemi Annual Report 1995

See also: <http://www.sveiby.com/articles/CelemiMonitor.html>

1.3.4. Leif Edvinsson: the Skandia experience

Leif Edvinsson was the right man, at the right moment and at the right place. At the beginning of the 1990s, further acceptance of the idea of intangible reporting asked for a success story that provoked the imagination of managers. Edvinsson, "an unabashed experimenter" (Stewart, 1997: p.75) was the man who succeeded in this assignment.

Inspired by Stewart's article "Brainpower", Leif Edvinsson applied for a job with the Swedish Insurance company Skandia. During the interview he showed the article to the Head of Insurance and Financial Services and said: "this is what your company should do: manage intellectual capital". In 1991 Leif Edvinsson was appointed by Skandia as the world's first director of Intellectual Capital.

Skandia

During the 1980s Skandia recognized more and more that a company's competitive strength lies less and less with the traditional accounting assets – buildings, equipment, inventories – than with a number of new factors, like individual talent, synergistic market relationships, and the ability to manage the flow of competence. They realized that if they could just get their hands around these new intangibles, develop ways to grow them, and measure them, they might just have the key to success (Edvinsson & Malone, 1997). But how?

Edvinsson's assignment was to grow and develop the company's Intellectual Capital as a visible, lasting value that would complement the balance sheet. Based on his first experiences he formulated three fundamental insights, which served as starting points for further implementation of the concept:

1. Intellectual Capital is supplementary, not subordinate, information to financial information
2. Intellectual Capital is non-financial capital, and represents the hidden gap between market value and book value.
3. Intellectual Capital is a debt issue, not an asset issue.

The latter means that intellectual capital should be seen as something that is borrowed from the stakeholders, that is, employees, customers, and so forth. With these insights Edvinsson went beyond the traditional accounting principles, according to which something can only be an asset if it can be measured in monetary terms and if it is owned by the company. Based on these insights Edvinsson defined Intellectual Capital as:

“Intellectual Capital is the possession of the knowledge, applied experience, organizational technology, customer relationships and professional skills that provide Skandia with a competitive edge in the market.”

The next challenge was to make the concept work. How to grow and develop intangibles? How to measure intellectual capital? At first this challenge led to a very long list of items that were valuable to the company, but which were not disclosed by the accounting system. It included such items as trademarks, concessions, customer databases, IT systems, core competencies, and so forth. This list of more than fifty items was reduced to two items. These two items represent the astonishing simple, but also powerful definition of intellectual capital:

Human Capital + Structural Capital = Intellectual Capital

Analogue to the two dimensions of knowledge, this simplified definition means that intellectual capital has a tacit and explicit component. A tacit component (human capital) mainly related to people and an explicit component (structural capital) mainly related to the organization.

- *Human Capital.* The combined knowledge, skill, innovativeness, and ability of the company's individual employees to meet the task at hand. It also includes the company's values, culture and philosophy. Human capital cannot be owned by the company.
- *Structural Capital.* The hardware, software, databases, organizational structure, patents, trademarks, and everything else of organizational capability that supports those employees' productivity – in a word, everything left at the office when the employees go home. Structural capital also includes customer capital, the relationships developed with key customers. Unlike human capital, structural capital can be owned and thereby traded.

It is important to stress that it is not one or the other. Intellectual capital is the combination of both human capital and structural capital. Human capital is the source of innovation and

renewal, but smart people alone is not sufficient. In order to make human capital productive structural assets are needed that facilitate the development and exchange of knowledge. From a management perspective, structural capital is more important than human capital, because it is the management's responsibility to build organizational assets.



Copyright © 2002 United Feature Syndicate, Inc.

Spring 1993, Skandia published its first (internal) Intellectual Capital Report, in which the hidden capital was revealed. Shortly after this internal report, Edvinsson was asked to put together a report for external publication, as a supplement to the traditional financial report. This resulted in the publication of *Visualizing Intellectual Capital* (1995), which again was received with great enthusiasm, both internally and externally. From all over the world, Edvinsson received more than 500 requests to put together IC-reports. Since then Skandia published an IC-report twice a year. Due to overwhelming interest the print numbers had to be increased every time. For the last edition, *Human Capital in Transformation* (1998), the print number was five times higher than the print number of the financial report!

Skandia Value Scheme

The Skandia Value Scheme also has its roots in the Konrad initiative (see above). However, Edvinsson combined the work of Sveiby with several other sources and developed a more detailed taxonomy. As we have seen above, the main distinction that can be made is the distinction between Human Capital and Structural Capital. Next we see that Customer Capital is presented as a subset of Structural Capital. Another subset of Structural Capital is Organizational Capital, which again is divided into Innovation Capital and Process Capital. Together this taxonomy adds up to a focus on four different areas: Human Capital, Customer Capital, Innovation Capital and Process Capital. These four areas are the main building blocks for the Skandia Navigator as presented below.

Skandia Market Value

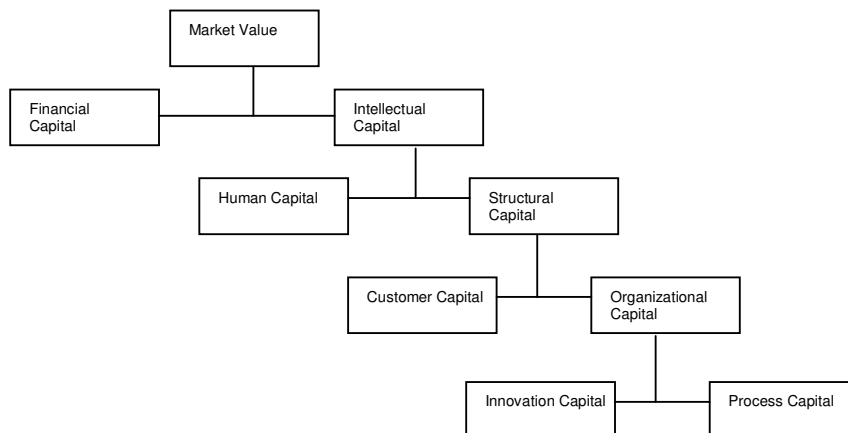


Figure 1.2.9: Skandia Market Value Scheme (Edvinsson and Malone, 1997)

An important contribution of Edvinsson was that he combined the work of Sveiby with two other sources. The first source was the connection that he made with Hubert Saint-Onge and Thomas Stewart. Together they shaped the concept into a format that can not only be communicated easily but also works in practice. It was Edvinsson who contributed the idea of structural capital. The other two “invented” customer capital. To each of them, human capital went without saying (Stewart, 1997).

Another source that can be recognized comes from the lowest level of the value scheme: innovation capital and process capital. These two kinds of intellectual assets, combined with the Skandia Navigator as presented below, shows the influence of Kaplan and Norton’s Balanced Scorecard (SOURCE). Both in the Balanced Scorecard and the Skandia Navigator, innovation is presented as the source of innovation and continuity. Innovation is the foundation of each organization. The Skandia Navigator visualizes this point very clearly.

Skandia Navigator

Edvinsson was ‘constantly seeking ways to “tangibilize hidden value” using new images by which to describe them. He compares intangibles to the roots of a tree (see above), the walls of a house or a body’s nervous system’ (Stewart, 1997: pp.75-76). The Skandia Navigator is an example of visualizing the relationships between different types of intangible assets. It is a different way of looking at value creation.

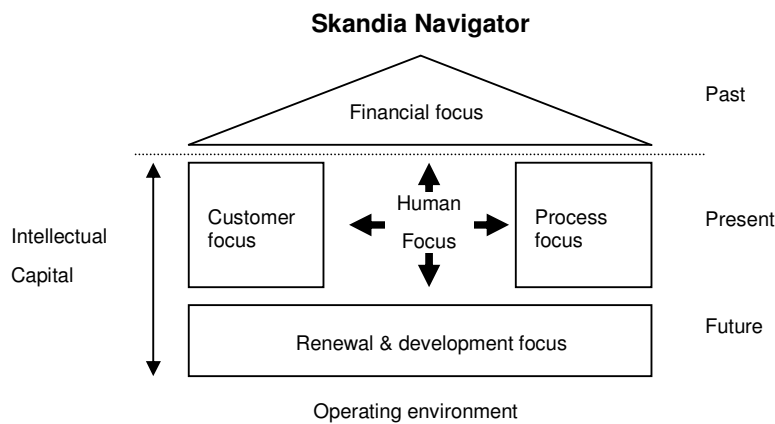


Figure 1.2.10: Skandia Navigator (Edvinsson and Malone, 1997)

Within the Skandia Navigator we recognize the four different types of intangible assets from the Skandia Value Scheme. The shape of the Navigator is like a house and represents the organization. It is clear that the financial focus (the roof) rests on the intellectual capital (the walls and the foundation) of the organization. Moreover, the human capital is explicitly presented as the heart of the organization. The different levels within the Navigator present a balanced monitor of past, present and future performance. Finally, notice that the Navigator is not composed of types of capital, but of focus areas. Value comes from focus on these areas:

1. *Human Focus*: consists of the competence and capabilities of employees and the commitment of the company to keep these skills updated.
2. *Customer Focus*: consists of the quality of the external relationships and the commitment of the company to maintain these relationships.
3. *Process Focus*: indicates the efficiency of the work processes and the commitment of the company to improve the quality of these processes.
4. *Innovation Focus*: indicates how well a company is preparing itself for the future.

Each focus area is translated into a series of indicators. Important starting point is that the

indicators have to be measurable, because numbers are the currency of international business. Moreover, qualitative measurement or a narrative will doom IC reporting to travelling the same path as the problem it was designed to fix (reveal the intangible sources of value creation). Finally, reporting with numbers makes information more tangible and dynamic (Edvinsson & Malone, 1997). This starting point distinguishes the Skandia Navigator from Sveiby's Intangible Assets Monitor, which explicitly leaves room for a qualitative approach. Moreover, whereas Skandia did not allow footnotes, Sveiby stimulates to use them to explain the measurements. An example is Celemi's Intangible Assets Monitor, which contains 32 footnotes.

A universal instrument?

The ultimate challenge according to Edvinsson is the development of a universal instrument for the measurement of intellectual capital. This will not only make life easier, but also make comparison of intangible performance possible. Precondition is that we identify a set of indicators that can be used by all organizations and recognize that all organizations need an additional set of specific indicators. The last chapter in his book *Intellectual Capital, realizing your company's true value by finding its hidden roots*, Edvinsson presents an inventory of 111 indicators which are applicable to all organizations. Further elaboration on this subject will follow below (emerging standard).

The main merits of Edvinsson are twofold. First, he was able to bridge the gap between theory and practice. His experimental nature, fundamental approach and persistence resulted in a best-practice which inspired people all over the world. Moreover, his experience at Skandia made the concept more robust and better applicable in practice. Second, Edvinsson succeeded in connecting the groundbreaking work of the Swedish IC-community to the rest of the world. His connection to Hubert Saint-Onge and Thomas Stewart gave the Intellectual Capital concept a global platform. The next paragraph describes this transatlantic connection.

1.3.5. The transatlantic connection

Although the influence of Hubert Saint-Onge, Thomas Stewart, and Patrick Sullivan can not be compared to Sveiby's and Edvinsson's, their contribution should not be underestimated. This paragraph elaborates on their contribution to the development of the concept of Intellectual Capital.

Hubert Saint-Onge: introducing the customer

Judged from the number of publications, it looks as if Hubert Saint-Onge (Senior Vice President Strategic Capabilities, Clarica) was of no importance to the intellectual capital movement. However, his contribution appeared to be indispensable for the acceptance of the topic.

Hubert Saint-Onge has been involved in the intellectual capital movement for more than ten years now. As Vice-President Learning Organization and Leadership Development he introduced intellectual capital at the Canadian Imperial Bank of Commerce (CIBC). Saint-Onge, according to Stewart an "earnest, bright-eyed enthusiast with a gift for abstract reasoning that does credit to the Cartesian roots of francophone education" (Stewart, 1997: p. 75) did not publish much. His work at CIBC and his contribution to the IC movement has been mainly described by others, often based on one of his many contributions to conferences.

Customer Capital

Although Saint-Onge is not the originator of the distinction between Structural Capital and Customer Capital, he certainly (in his conversations with Edvinsson and Stewart) confirmed the importance of the concept of Customer Capital as a distinct piece of organizational value. "Leif gave us the idea of structural capital," Saint-Onge says of their brainstorming

sessions. “We gave him customer capital.” To each of them, human capital went without saying (Stewart, 1997: p76). This consensus about the main types of intangibles became the basis of today’s emerging standard (see below).

- Human capital is the source of innovation and renewal.
- Structural capital packages human capital and permits it to be used again and again.
- Customer Capital is the value of an organization’s relationships with the people with whom it does business. “It’s the likelihood that our customers will keep doing business with us”.

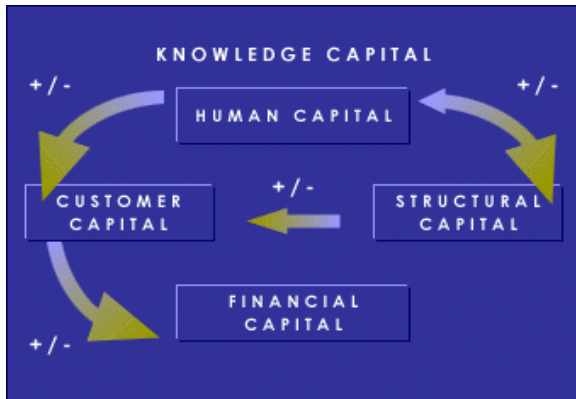


Figure: 1.2.11: Saint Onge’s Knowledge Capital Framework (www.knowinc.com)

Not only did Saint-Onge stress the importance of customer capital. He also highlighted the interdependence of the different types of intangibles. It is through combination of different types of intellectual capital that a company creates value. Therefore, we should not only observe the different types, but also the way they are linked and the effectiveness of these combinations in creating value. The latter is made very clear in Saint-Onge’s *Knowledge Capital Framework*.

As stated above, Saint-Onge was not the originator of the distinction between structural and customer capital. Saint-Onge’s concept of customer capital is very similar to Sveiby’s concept of *external structure* (based on the work of the Konrad Group). Whereas Saint-Onge defines it as “the depth (penetration), width (coverage) and attachment (loyalty)” (Stewart, 1997: p.77), Sveiby defines the concept of external structure as relationships, brands and reputations (Sveiby, 1997). Both seem to give expression to the quality of the relationship with customers. Saint-Onge’s main contribution has been linguistic. The term customer capital made the concept more powerful and better to understand, which was of vital importance to creating acceptance.

Interdependence

The interdependence of the different types of intangibles is closely related to the concept of customer capital. According to Saint-Onge, customer capital is wealth that has accumulated as a result of a relationship between producer and consumer and which is owned by both. Customer capital can be tacit or explicit. The closer the partnership between buyer and seller, the greater the surplus can be (Stewart, 1997p.158). According to Saint-Onge, buyer-supplier intimacy (customer capital) is the sum of human capital and structural capital. In a sense, this definition is closely related to Edvinsson’s definition of intellectual capital (see above).

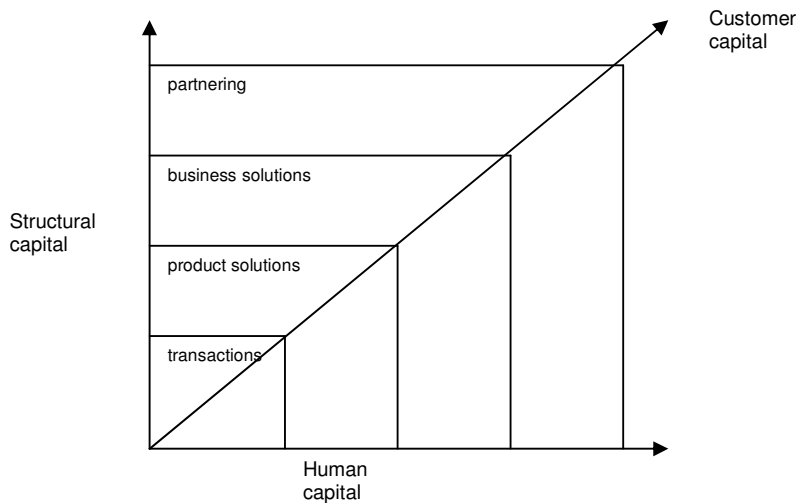


Figure 1.2.12: Stages of buyer-supplier intimacy as a result of the combination of human capital and structural capital (CIBC in: Stewart 1997, p.158)

Within the above figure, Saint-Onge visualizes the different stages of customer intimacy as a result of the growth of human and structural capital. Moreover, growth of human and structural capital is also the result of increase of customer intimacy. The three types of intangibles seem to be interdependent. The transition from *transaction* to *partnership* within this figure is the result of growth of all different (although related) types of intellectual capital.

So, the main contribution of Saint-Onge is that he made the concept of intellectual capital more powerful and better to understand, which was necessary to increase awareness and acceptance. Together with Edvinsson and Stewart, he gave meaning to the topic and created a foundation for today's intellectual capital movement.

Thomas Stewart: the herald

Thomas Stewart is the next in line of the 'founding fathers'. As an influential journalist writing for Fortune, he had the power to introduce the topic of intellectual capital to a larger (and influential) public. Stewart first discussed the term intellectual capital with Ralph Stayer, chief executive officer (CEO) Johnsonville Foods from Wisconsin in 1990. In a conversation about the essence of wealth they concluded that the most important means of production were no longer the physical or monetary means, but intelligence or "intellectual capital". Moreover, they also observed that companies did not report about these important means of production in their (financial) reports.

Stewart became obsessed with the subject and published the first of a series of articles about knowledge as a means of production in January 1991. Shortly after, he published "Brainpower", a longer article with which he attracted the attention of Leif Edvinsson. Their personal relationship and the experiences of Edvinsson with applying the ideas at the Swedish insurance company Skandia resulted in a series of articles about the Skandia experience. The most well known article is "Intellectual Capital", published in October 1994.

His book *Intellectual Capital, The New Wealth of Organizations* (1997), was one of the four books about this topic that was published within one year and probably the best readable of all. Based on numerous quotations, illustrations and personal anecdotes, Stewart makes the rather sticky subject accessible for the reader. Like Sveiby, Stewart widely elaborates on the increased importance of knowledge in organizations. He uses terms like knowledge, intellectual capital, knowledge assets, knowledge management and intellectual capital management interchangeably. "Knowledge has become the primary ingredient of what we make, do, buy, and sell. As a result, managing it – finding and growing intellectual capital, storing it, selling it, sharing it – has become the most important economic task of

individuals, businesses, and nations” (Stewart, 1997p. 12). In this sense we can speak about a revolution or a new reality which asks for new (management) skills and new ways of organizing.

The distinguishing characteristic of the knowledge-based economy and knowledge-intensive organizations is the so-called “de-materialization”. “It is characteristic for knowledge companies to strip their balance sheets of fixed assets” (Stewart, 1997:p. 34). The value of knowledge intensive organizations is mainly based on intangible assets. Where Sveiby spoke about the “invisible balance sheet”, Stewart describes these assets as the “hidden gold” of organizations, because traditional (financial) reporting methods do not reveal the value of these assets. In order to reveal the hidden value, Stewart presents a “treasure map” mainly based on the experiences of Edvinsson and Saint-Onge.

Like Edvinsson, Stewart acknowledges the fundamental distinction between human and structural capital. It goes without saying that human capital is our most important asset, however, in order to be successful, organizations need to have an infrastructure that enables the dissemination of knowledge from one individual to the other. According to Stewart, structural capital is equivalent to knowledge management. “What leaders need to do is contain and retain knowledge, so that it becomes company property. That’s structural capital. Simply put, it is knowledge that doesn’t go home at night” (Stewart, 1997:p. 108). And therefore, he concludes, structural capital is more important than human capital. Whereas human capital is the source of innovation, only the organization can leverage the specialized knowledge of the individual knowledge worker. According to Stewart structural capital should be the main concern of management, because it belongs to the organization as a whole. Moreover, structural capital is of greater importance because it can be reproduced and shared.

Despite the acknowledgement of the fundamental difference between human and structural capital, Stewart followed Saint-Onge’s scheme, putting customer capital on the same level as human and structural capital, on the grounds that customers, like employees, are not the property of the organization. Crucially, intellectual capital is not created from discrete wads of human, structural, and customer capital but from the interplay among them. Unfortunately, he does not elaborate on this subject.

Beyond any doubt, the main contribution of Stewart was that he presented the topic to a larger public. With his easy and accessible style of writing, his publications in Fortune and his book Intellectual Capital he reached a large audience and contributed to a better understanding and acceptance of the strategic importance.

1.3.6. An emerging standard?

The main merit of the first generation of authors within the field of Intellectual Capital is that they developed many different models and methods to measure IC. The main merit of the second generation authors is that they have tried to bring them together in one (more) single model. This paragraph gives a brief overview of models and an introduction to what seems to be the emerging standard. Next we will go into Edvinsson’s idea of combining generic IC-indicators with company specific indicators.

Overview of models

The result of the first generation intellectual capital is a plethora of methods and many authors have given overviews of these methods (Bontis et al., 1999; Petty & Guthrie, 2000; Bontis, 2001; Andriessen, 2004). Some of these overviews compare more than 25 models. A detailed description of all of these methods would go beyond the scope of this book. Moreover, we think it is more important to search for similarities. Therefore, in order to give an impression, we limit our overview to listing the most important models, their originator(s) and a very short description of the intention of the model. For a more detailed description we

refer to the above mentioned overviews.

Model	Originator(s)	Description
Balanced Scorecard	Kaplan and Norton (1992)	A performance measurement system that uses indicators to supplement accounting information.
Calculated Intangible Value	NCI Research	Calculates the present value of the premium earnings after taxes when earnings are compared with the industry average return on assets (ROA).
Citation Weighted Patents	Hall et.al. (2001)	Acts as a measure of the economic value of innovative output.
Economic Value Added™	Stern Stewart and Co.	Method to calculate value creation in companies.
Holistic Value Approach	Roos et.al. (1997)	Measures IC into one single measure.
Inclusive Value Methodology	M'Pherson and Pike (2001)	Applies the rigor of scientific measurement theory to the measurement of intangible value.
Intangible Asset Monitor	Sveiby (1997)	Measurement method to help manage knowledge intensive companies.
Intangible Scoreboard	Gu and Lev (2002)	Financial Valuation method to value intangibles (top-down).
Intellectual Capital Audit	Brooking (1996)	Six-step audit followed by a valuation of all the different types of assets.
Intellectual Capital Benchmarking System	Viedma (2001)	Benchmarking system for assessing intellectual capital.
Intellectual Capital Dynamic Value	Bonfour (2002)	Creates a link between the financial value of assets and the internal performance.
Intellectual Capital Framework	Sullivan (1998)	Focuses on extracting value from existing knowledge.
Intellectual Capital Index	Roos et.al. (1997)	First method developed for measuring intangibles.
Intellectual Capital Monitor	Stam (2001)	Performance measurement system that uses indicators to assess intangibles.
Intellectual Capital Statement	Mouritsen et.al. (2001)	Method that gives direction to knowledge management initiatives.
iValuing Factor	Standfield (2001)	Designed to improve management decision making and to include market value risks in the decision-making process.
Market-to-Book Ratio		Difference between market value and book value as an indicator of the value of intellectual capital.
Skandia Navigator	Edvinsson (1997)	Performance measurement method, closely related to the Balanced Scorecard.
Technology Factor	Khoury (1998)	Method to measure intellectual properties (copyrights, patents, etc.).
Tobin's Q	Tobin	Ratio between the market value of an asset and its replacement cost.
Value-Added Intellectual Coefficient	Pulic (2003)	Measures efficiency of key resources in companies.
Value Chain Scoreboard	Lev (2001)	Financial Valuation method to value intangibles (bottom-up).
Weightless Wealth Toolkit	Andriessen (2004)	Identifies intangibles, measures their value and develops management agenda.

Table 1.2.4: Overview of IC-models (Based on: Andriessen, 2004)

Proposed framework

Evaluating the state of the field, we recognize an emerging standard. Comparison of several intellectual capital models shows us that many of them are based on a more or less same classification:

	Intangible Assets Monitor (Sveiby)	Skandia Navigator (Edvinsson)	Intellectual Capital Index (Roos)
Human Resources	Individual's competences	Human Capital	Human Capital
Organizational Resources	Internal Structure	Process Capital	Infrastructure Capital
Relational Resources	External structure	Customer Capital	Relationship Capital

Table 1.2.5: Comparison of intellectual capital models (Stam, 1999, 2001).

All three models are based on a taxonomy of three. The logic of these models is that intellectual capital is the product of interaction of these three different classes of intangibles: human resources, organizational resources and relational resources (Roos, 2003).

- **Human Resources:** This first class represents anything related to the people within the organization, the employees, their tacit knowledge, skills, experience and attitude.
- **Organizational Resources:** This second class represents the 'tangible' intangibles. Everything of value that stays behind, after the employees have left the organization, like codified knowledge, procedures, processes, goodwill, patents, and culture.
- **Relational Resources:** This third class represents the relationship with customers, suppliers and other external stakeholders. The value of customer capital is mainly determined by the extent to which an organization is able to maintain confidence in its reputation.

Although the intellectual capital of an organization is unique and can never be compared objectively, we can improve comparability by using the same conceptual models. Moreover, we think that the above taxonomy of three has proven to be a sound basis for measuring and comparing intellectual capital on both firm and national level. More and more, this classification is used as a starting point for reporting and communicating about intellectual capital. Therefore it is proposed (Bontis, 2002) to make a distinction between human capital, structural capital and relational capital.

Intellectual Capital Monitor

Based on this taxonomy we can create our own scorecard, navigator or monitor for the measurement of intangibles. However, in order to stress the importance and differences between past, present and future developments, we think it is important to add a second layer of classification. Each of the three classes of intellectual capital should be monitored from three different perspectives:

- *Assets (present).* This perspective gives an indication of the present power of an organization. It provides an overview of the current main assets.
- *Investments (future).* This perspective gives insight into the future power of an organization/nation. To maintain or strengthen its present power, organizations should invest in its potential continuously.
- *Effects (past).* This perspective shows the extent to which the organization has made

its intangibles productive during the past period².

The windows and perspectives are combined in a 3 by 3 matrix (see table 4). Implementation of this monitor means filling the cells with appropriate performance indicators. Appropriate means that the indicators are aligned with the organizational goals. The number of indicators should be limited to two or three per cell, which counts up to a total of 18-27 indicators. The power of this model is in its simplicity, which makes it easy to implement, communicate and understand.

	Human capital	Structural capital	Relational capital
Assets			
Investments			
Effects			

Table 1.2.6: Intellectual Capital Monitor (Andriessen & Stam, 2004)

Three-Tier Model

Consequence of the nature of intangibles is that they are unique in every context. In a sense, the combination of intangible resources is a company's DNA: the code that determines its uniqueness. Nevertheless, one of the main reasons for management to measure intangibles is to reveal the company's relative position. In other words, they want to compare their performance with the performance of their competitors.

A model that pays respect to the uniqueness of intangibles on the one hand, and the need for comparison on the other hand, is the Three-Tier Model of Corporate Transparency (PWC, 2002). Within this Three-Tier Model the above proposed Intellectual Capital Monitor can be applied on all levels: national, industry and company. Together they reveal the relative competitive position of an organization.

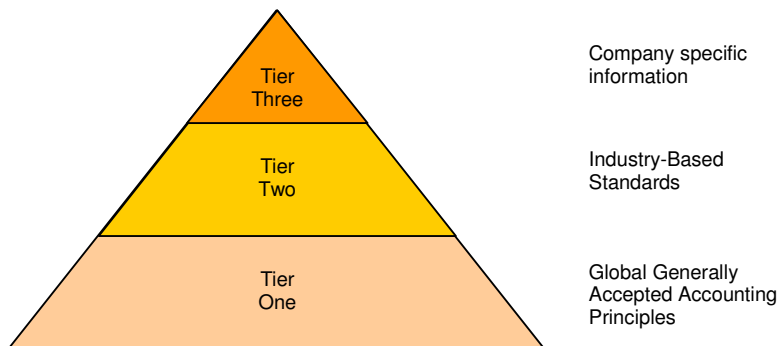


Figure 1.2.13: Three-Tier Model of Corporate Transparency (PWC, 2002)

The Three-Tier Model of transparency offers a new vision on corporate reporting (PWC, 2002):

- **Tier One**
A set of global generally accepted accounting principles (Global GAAP).
- **Tier Two**
Industry specific standards for measuring and reporting performance, consistently applied and developed by the industries themselves.
- **Tier Three**
Company-specific information including strategy, plans, risk management practices,

² Effects can be further divided into output, outcome and impact. See for example the Intellectual Capital Report 2003 of the Swedish Center for Molecular Medicine

compensation policies, corporate governance and performance measures unique to the company.

The idea of this model is that it distinguishes between general, industry specific and firm specific indicators. "It is assumed that an indicator is industry specific when it refers to processes, definitions, etc. that are particular to that industry or that might differ from manufacturing to services. On the other hand, an indicator is firm specific, when it requires a previous definition by the firm, for example, any indicator referring to "high potential" employees would require a definition of what the company considers as "high potential" employees. These latter are not comparable across firms" (Sanchez et al., 2000: p.321). The three tiers should not be seen as separate, distinctive reporting levels. Rather, they should serve as an integrated model for improving transparency overall and make inter-firm comparison possible.

Indicators

At the end of the day, measuring intellectual capital is about indicators. An indicator is "a reasonable trustworthy estimation of an unknown value" (Stam, 2002). The most common mistake that is being made, working with indicators, is that they are perceived to be objective truths. An indicator is nothing more than a signal for attracting attention, be it a very valuable signal. Indicators aid in monitoring the progress and success of management initiatives, they determine whether certain circumstances exist or criteria have been satisfied. These measures, which do not have to be quantitative, serve as input for the management decision process.

As discussed above, a well designed intellectual capital report consists of a balanced combination of indicators. These indicators can be quantitative, but also qualitative. They can be expressed in numbers, percentages or monetary value; they can be presented in figures, words, colours, smileys or dashboards. Whatever the form, all indicators should be SMART: specific, measurable, action-oriented, realistic and time-related. Moreover, indicators should also be stimulating.

Through experience we know that the value of measurement increases over the years. Organizations that decide to measure intellectual capital should be willing to invest at least three years, before deciding to continue or not. Not only do we need a number of data to reveal trends and developments, but also do we need to practice working with indicators. The latter can be seen as a process of change. We ask our management and employees to supplement traditional reporting methods, adapt a different perspective on value creation and act accordingly. This takes time.

It is not difficult to come up with many indicators, Examples are the overviews given by Edvinsson and Sveiby (Edvinsson & Malone, 1997; Sveiby, 1997). The idea however is to formulate a limited set of indicators that tells the story of your company (business unit, department). The Intellectual Capital Monitor should be seen as an aid in distinguishing between different kinds of indicators, in order to create a balanced overview.

	Human capital	Structural capital	Relational capital
Assets	<ul style="list-style-type: none"> • number of employees (fte's) • number of productive employees (revenue-generating) • number of years with the company • level of education • average age • seniority • number of years with relevant experience • rookie-ratio • competence level • employee satisfaction 	<ul style="list-style-type: none"> • support staff (%) • number of automated workplaces • average age of operational systems • ICT staff (%) • availability systems (%) • satisfaction support staff 	<ul style="list-style-type: none"> • number of customers • turnover commercial employees • number of distribution channels • number of assignments per employee • average age of customer relationships • market share • customer satisfaction
Investments	<ul style="list-style-type: none"> • employee turnover • turnover of professionals/experts • competence enhancing customers • growth of professional competences • investments in education • training days • investments in R&D 	<ul style="list-style-type: none"> • investments in ICT (%) • investments in process improvement • education support staff • organizational enhancing customers 	<ul style="list-style-type: none"> • number of new products/services • patents, copyrights, trademarks • new customers (%) • repeat orders • surrender ratio (new assignments / number of assignments at the beginning of the year) • time invested in customer relationships • time invested in acquiring new customers • image enhancing customers (%)
Effects	<ul style="list-style-type: none"> • value added per professional/expert (\$) • value added per employee (\$) • return per employee • number of billable hours • number of billable hours as % of available hours • average fee (\$) 	<ul style="list-style-type: none"> • customers / support staff • proposals / contracts (%) • return per support staff • support costs • processing-time • productivity-index 	<ul style="list-style-type: none"> • Return per customer • high margin customers • return top-10 customers • tender (win/loss) index (%) • billable hours • return new products/services • return new customers

Table 1.2.7: Examples of indicators (www.intellectualcapital.nl)

Three reasons for IC-reporting

Before we start measuring intellectual capital, it is important that we are aware what we are trying to achieve. Based on an extensive analysis of the motivations for measuring intellectual capital, Andriessen (2004) concluded that in practice many solutions (measuring methods) have been designed in search of a cause. Probably this is not only symptomatic for intellectual capital, but for management solutions in general. However, we think it should be

the other way round: first define the problem you are trying to solve (why), and then choose a solution that is designed to solve this kind of problem (how). Andriessen (2004) signals three main categories of reasons for reporting about IC:

1. Improving internal management
This category ranges from the general need of raising awareness to the specific problem of improving the management decision process. Within this category we can make a further distinction between measuring the results of past events (retrospective) and improving the strategy development process by creating resource-based strategies (prospective).
2. Improving external communication
As a result of a loss of relevance of financial statements the second category of problems is related to the diminishing value of business information. Measuring intangibles within this category aims at better communicating organizational performance to external stakeholders.
3. Statutory and transactional issues
Statutory reasons for valuing intangible resources are the result of situations in which it is mandatory to carry out a valuation exercise. Examples are transaction pricing, taxation planning and impairment testing.

The consequence of the wide variety of problems related to measuring and managing intangibles is that there is also a wide variety of solutions (see inventory of methods above). Improving the management of intangible resources in itself is a noble cause but it does not justify the measurement in itself. The existence of a gap between market and book value is in itself not enough reason to start measuring intangibles. Moreover, if we do think that measuring is the best solution to our problem, we should be aware of the problem we are trying to solve, so that we can choose the appropriate method.

1.4. *Intellectual Capital: the next phase?*

After more than a decade of creating awareness and designing taxonomies, the focus of the intellectual capital movement seems to shift from distinctions towards interrelations. The main question is no longer “what are the main sources of value creation?”, but “how do these sources enhance each other?” This idea of enhancement reflects the concept of multiplication in the ‘New Growth Theory’ (Romer, 1990, 1994). Both in intellectual capital- and in knowledge productivity literature, we find many references to this theory (Stewart, 1997; Lev, 2000; Aberg & Edvinsson, 2001; Edvinsson, 2002; Zegveld & Den Hartigh, 2002).

In his New Growth Theory, Romer distinguishes between ‘ideas’ and ‘things’ (Romer, 1993). The critical difference is that things can only be used by one person and ideas can be used by many people at the same time, provided that they can be communicated. Ideas have high impact, because they can be replicated at a large scale and at low costs. They are the true force behind productivity improvements and economic growth. “The ability to leverage physical and financial assets is limited and getting more so. The ability to leverage knowledge capital is unlimited and getting less so. An airplane can fly on just one route. A reservation system is limited only by the number of people in the world” (Stewart, 2002: p.17). So the main source of productivity lies in the system, not in the airplane. Although conceptually distinct, there are also many tight interactions between ideas and things. In fact, human capital makes ideas, and ideas help to make human capital. Both ideas and things are necessary, but not sufficient. They enhance each other. This idea of interdependent and mutual enhancing factors can be found at many places. Examples are Castells’ (1999) dialectical interaction between society and technology, Florida’s (2002) “creative capital theory”, Nonaka and Takeuchi’s (1997) theory of knowledge conversion, Weggeman’s (1997) formula of knowledge, Edvinsson’s (1997) definition of intellectual capital, Roos’ idea of

resource transformation (see 1.4), etc..

Although we find more and more references to the New Growth Theory, the early intellectual capital literature did not really elaborate on this subject. Authors like Brooking (1998), Sveiby (1997), Edvinsson and Malone (1997), and Stewart (1997) were more concerned with identifying and measuring the different classes of intangibles, than revealing their interrelationships. However, this does not mean that interdependencies kept unnoticed. First of all, the idea of interdependence is present in almost all intellectual capital models, because the logic of these models is that intellectual capital is the product of interaction of the different classes of intangibles. (Roos, 2003). "It should be stressed that the intellectual capital of the firm can be increased either by leveraging the level of human capital, structural capital and relational capital or by promoting interactions between the three groups. They should not be seen as watertight compartments but as highly interlinked groups of intangibles" (Sanchez et al., 2000: p.325). Example of this logic is Sveiby's (1997) suggestion of measuring 'competence-enhancing customers' and the 'customers contributing to internal structure'.

The best evidence of the idea of interdependence can be found in the respective definitions of human capital and structural capital. Sveiby (1997), Stewart (1997) and Edvinsson and Malone (1997) are very clear about the interdependence between these two classes of intellectual capital. Sveiby refers to Weick (1995) when he argues that "People create the organization by interacting with each other and thus enacting the environment" (Sveiby, 1997). Edvinsson refers to the interdependence between human capital and structural capital as a 'double-arrow dynamic'. "Human capital is what builds structural capital, but the better your structural capital, the better your human capital is likely to be" (Edvinsson & Malone, 1997: p.35). So structural capital is both the enabler and the result of human capital at the same time. Finally, Stewart makes the connection with the New Growth Theory: "Human capital matters because it is the source of innovation and renewal (...). But smart individuals don't necessarily make for smart enterprises". Structural capital is what "packages human capital and permits it to be used again and again to create value (...)" (Stewart, 1997: p.76-77). So human capital is what Romer would call a 'thing', because it can not be replicated. Structural capital is, what Romer would call 'ideas', because it can be replicated at a large scale and at low costs. This implies that structural capital is the true force behind productivity. This idea of structural capital being the main source of productivity is also reflected in Castells' statement that the real sources of productivity are the "cultural-institutional attributes of the whole social system" (Castells, 1996: p.100).

1.4.1. IC-multiplier

In 1997 Edvinsson defined intellectual capital as the sum of human capital and structural capital ($IC=HC+SC$). Five years later he defines intellectual capital as the multiplication of human capital and structural capital ($IC=HC \times SC$) (2002: p.95). This small, but significant change indicates an important deepening in the understanding of the dynamics of intellectual capital.

In Corporate Longitude, Edvinsson {Edvinsson, 2002 #246} elaborates on the subject of intellectual capital multiplication. Based on the work of Romer (1990) he suggests that the multiplier effect of intellectual capital leads to an exponential relationship instead of a linear relationship. "The whole can be many times greater than the sum of the parts" (Edvinsson, 2002: p.93). Within the evolution of intellectual capital management, Edvinsson sees a shift from the identification and visualization of intangibles, with a dominant focus on human capital, towards a systematic transformation of human capital into structural capital as a multiplier.

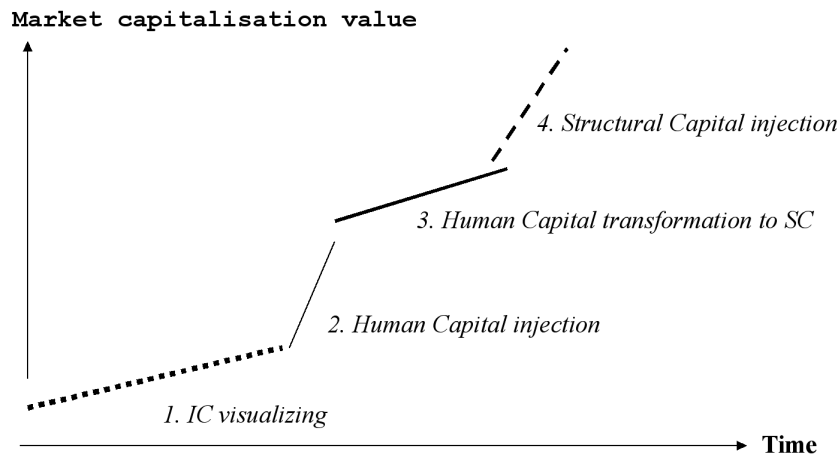


Figure 1.2.14: Evolution of intellectual capital management
(www.kwork.org/stars/edvinsson.html)

Phase one of intellectual capital management focused on the visualization of intangibles from a reporting perspective. Example of this phase is the Skandia intellectual capital reports. Phase two concerned human capital injection, often labelled *knowledge management*. Phase three 'is the systematic transformation of human capital into structural capital as a multiplier, with much more sustainable earnings potential for the organization' (2002: p.93). This phase is focused on the packaging of knowledge into multiplicative recipes to be shared globally and rapidly. It is focused on collectively growing structural capital, because 'knowledge recipes are set to become the new global export items rather than the flow of goods' (p.94). Finally, phase four is characterized by structural capital injections from external sources. This will have a 'turbo-effect' on the maximizing of IC.

According to Edvinsson, the multiplier effect has become the critical perspective. "This shifts the focus of leadership from human capital to structural capital as a multiplier of human talents" (2002: p.93). "The mistake has been to see human capital in a vacuum. Human capital requires infrastructure to create a springboard for people's talent potential. (...) Human capital can only flourish if the structure is established to enable it to do so. Either in a void is worthless" (2002: p.95). Most companies struggle with the notion of structural capital (especially with its sub-component organizational capital). Organizational capital should be seen as the structure of the organization that allows knowledge workers to leverage their talents. The question then becomes: What is the optimal way to organize? "How do you create structures which maximize human potential?" (2002: p.96). In order to create a springboard effect or multiplier effect we should develop effective organizational structures to optimize the efforts of knowledge workers.

1.5. Lessons Learned

- The past decades a resource-based view of the firm has emerged. This resource-based view is based on the assumption that firm-specific competencies have become the most important source of sustainable competitive advantage. The knowledge-based theory of the firm can be seen as a further specification of the resource-based view.
- Parallel and closely related to the knowledge-based theory a more holistic perspective on the value creating resources of the organization emerged. This so called intellectual capital movement further elaborated on the nature of intangibles and the way they should be measured and managed. Like knowledge, the term intellectual capital counts for numerous interpretations. However, we also see some

core-elements of agreement. Based on these elements we define intellectual capital as: *all intangible resources that are available to an organization, that give a relative advantage, and which in combination are able to produce future benefits.*

- The roots of today's intellectual capital movement lies in the mid 1980's in the work of the Konrad Group and Karl-Erik Sveiby. However, it was Leif Edvinsson and Thomas Stewart who, fuelled by the power of popular communication, gave the movement a rocket launch in the mid-nineties. The work of Sveiby, Edvinsson, Saint-Onge, Sullivan, Roos, Mouritsen and many, many others resulted in a plethora of methods.
- Evaluating the state of the field, we recognize an emerging standard, whereas many of these methods are based on a taxonomy of three: human resources, organizational resources and relational resources. Therefore the proposed Intellectual Capital Monitor is based on this taxonomy of three. The concept of intellectual capital can be applied on national, industry and company level, however before we start measuring it is important that we are aware of the goals we are trying to achieve.

1.6. Suggested Reading

Andriessen, D. G. (2004). *Making Sense of Intellectual Capital*. Amsterdam: Elsevier Butterworth-Heinemann.

Bontis, N. (2002). Managing Organizational Knowledge by Diagnosing Intellectual Capital. Framing and Advancing the State of the Field. In N. Bontis & C. W. Choo (Eds.), *The Strategic Management of Intellectual Capital and Organizational Knowledge* (pp. 621-642). Oxford, New York: Oxford University Press.

Edvinsson, L., & Malone, M. S. (1997). *Intellectual Capital. The proven way to establish your company's real value by measuring its hidden brainpower*. London: HarperBusiness.

Stewart, T. A. (1997). *Intellectual Capital, The new wealth of organizations*. New York: Doubleday.

Sveiby, K. E. (1997). *The New Organizational Wealth. Managing & Measuring Knowledge-based Assets*. San Fransisco: Berret-Koehler Publishers Inc.

1.7. Literature

- Aberg, D., & Edvinsson, L. (2001, 17-18 May). *The IC Multiplier and the importance of structural capital*. Paper presented at the 4th Intangibles Conference on Advances in the Measurement of Intangible Capital, New York University, Stern School of Business.
- Andriessen, D. G. (2004). *Making Sense of Intellectual Capital*. Amsterdam: Elsevier Butterworth-Heinemann.
- Andriessen, D. G., & Stam, C. D. (2004). *IC of the EU, Measuring the Lisbon Agenda*. Diemen: Center for Research of Intellectual Capital.
- Bontis, N. (2001). Assessing knowledge assets: a review of the models used to measure intellectual capital. *International Journal of Management Reviews*, 3(1), 41-60.
- Bontis, N. (2002). Managing Organizational Knowledge by Diagnosing Intellectual Capital. Framing and Advancing the State of the Field. In N. Bontis & C. W. Choo (Eds.), *The Strategic Management of Intellectual Capital and Organizational Knowledge* (pp. 621-642). Oxford, New York: Oxford University Press.
- Bontis, N., Dragonetti, N. C., Jacobsen, K., & Roos, G. (1999). The Knowledge Toolbox: A review of the tools available to measure and manage intangible resources. *European Management Journal*, 17(4), 391-402.
- Brooking, A. (1998). *Intellectual Capital. Core asset for the Third Millennium Enterprise*. London: International Thomson Business Press.
- Castells, M. (1996). *The Rise of the Network Society, The Information Age: Economy, Society and Culture, Vol. 1* (Vol. 1). Cambridge, MA; Oxford, UK: Blackwell.
- Castells, M. (1999). *The Information Age: Economy, Society and Culture, Volumes I, II & III: The Rise of the Network Society/The Power of Identity/End of The Millennium* (Vol. 1-3). Cambridge, MA; Oxford, UK: Blackwell.
- Drucker, P. F. (1993). *De post-kapitalistische maatschappij: onze maatschappij van organisaties, het staatsbestel en kennis*. Schiedam: Scriptum.
- Edvinsson, L. (2002). *Corporate Longitude*. London: Pearson Education.
- Edvinsson, L., & Malone, M. S. (1997). *Intellectual Capital. The proven way to establish your company's real value by measuring its hidden brainpower*. London: HarperBusiness.
- Florida, R. (2002). *The Rise of the Creative Class*. New York: Basic Books.
- Grant, R. M. (1996). Toward a knowledge-based theory of the firm. *Strategic Management Journal*, 17(10 (Winter Special)), 109-122.
- Hamel, G., & Prahalad, C. K. (1993). Strategy as stretch and leverage. *Harvard Business Review*(March-April), 75-86.
- Hamel, G., & Prahalad, C. K. (1994). *Competing for the Future*. Boston, Massachusetts: Harvard Business School Press.
- Hansen, M. T., Nohria, N., & Tierney, T. (1999). What's your strategy for managing knowledge? *Harvard Business Review*, 106-116.
- Lev, B. (2000). *Intangibles. Management, Measurement, and Reporting (internet version)*, from www.baruch-lev.com
- Nonaka, I. (1991). The knowledge creating company. *Harvard Business Review*, 69(6), 96-104.
- Nonaka, I., & Takeuchi, H. (1997). *De kenniscreërende onderneming. Hoe Japanse bedrijven innovatieprocessen in gang zetten*. Schiedam: Scriptum.
- Petty, R., & Guthrie, J. (2000). Intellectual capital literature review. *Journal of Intellectual Capital*, 1(2), 155-176.
- Polanyi, M. (1974). *Personal Knowledge (first printed 1958)*. Chicago: University of Chicago Press.
- Polanyi, M. (1983). *The Tacit Dimension (first printed 1966)*. Gloucester, Mass.: Peter Smith.
- Porter, M. (1980). *Competitive Strategy*. New York, NY: Free Press.
- Prahalad, C. K., & Hamel, G. (1990). The Core Competence of the Corporation. *Harvard Business Review*, 68(3), 79-91.
- PWC. (2002). *Transparency in Corporate Reporting. ValueReporting(tm) Review 2003*. London: PriceWaterhouseCoopers.
- Romer, P. (1990). Endogenous Technological Change. *Journal of Political Economy*, 98(5, part 2), 71-102.
- Romer, P. (1993, 11 September). Ideas and things. *Economist*, 328, 70-72.
- Romer, P. (1994). The Origins of endogenous growth. *Journal of Economic Perspectives*, 8(1), 3-22.
- Roos, G. (2003). *An Intellectual Capital Primer*, from www.intcap.com

- Sanchez, P., Chaminade, C., & Olea, M. (2000). Management of intangibles. An attempt to build a theory. *Journal of Intellectual Capital*, 1(4), 312-327.
- Stam, C. D. (1999). Kennismanagement: de derde golf. Het meten van weten. In J. Bijl, E. van den Honert, C. D. Stam & P. Verver (Eds.), *Managementwijzer Kennismanagement* (Vol. 2e geheel herziene druk, pp. 11-18). Noordwijk: de Baak - Management Centrum VNO-NCW.
- Stam, C. D. (2001). Intellectual Capital geeft invulling aan Business Intelligence. *KM Vakblad over kennismanagement*, 7, 10-15.
- Stam, C. D. (2002, november). KM-effectmeting: een redelijk betrouwbare schatting. *IK Tijdschrift over Intellectueel Kapitaal*, 1, 8-12.
- Stewart, T. A. (1997). *Intellectual Capital, The new wealth of organizations*. New York: Doubleday.
- Stewart, T. A. (2002). *The Wealth of Knowledge. Intellectual capital and the 21st Century Organization*. London: Nicholas Brealey Publishing.
- Sveiby, K. E. (1997). *The New Organizational Wealth. Managing & Measuring Knowledge-based Assets*. San Fransisco: Berret-Koehler Publishers Inc.
- Sveiby, K. E., & Lloyd, T. (1988). *Managing Knowhow. Increase profits by harnessing the creativity in your company*. London: Bloomsbury.
- Weggeman, M. (1997). *Kennismanagement; inrichting en besturing van kennisintensieve organisaties*. Schiedam: Scriptum.
- Weick, K. E. (1995). *Sense-making in organizations*. London: Sage Publications.
- Zegveld, M. A. (2000). *Competing with dual innovation strategies. A framework to analyse the balance between operational value creation and the development of resources. Dissertation*. The Hague: werk-Veld bv.
- Zegveld, M. A., & Den Hartigh, E. (2002). De productiviteit van kennis. In P. van Baalen, M. Weggeman & A. Witteveen (Eds.), *Kennis en Management* (pp. 104-127). Schiedam: Scriptum.