



# Intellectual capital statements on their way to the stock exchange

Intellectual  
capital  
statements

## Analyzing new reporting systems

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### Abstract

**Purpose** – The purpose of this paper is to propose and illustrate the use of a set of rules to make an analytical reading of the indicators of an intellectual capital statement possible.

**Design/methodology/approach** – The paper proposes a model to analyze intellectual capital statements and applies this model to an intellectual capital statement and an IPO prospectus, as these two reporting forms are suggested to be similar. Thus, they are analyzed using the same methodology.

**Findings** – The paper demonstrates that it is possible to analyze prospectuses and intellectual capital statements systematically and even to compare companies on that basis. Since IPOs are often already part of the capital market's information, the similarities between reading IPOs and intellectual capital statement suggest that intellectual capital statements convey company-specific information relevant for financial analysts.

**Practical implications** – The paper presents an analytical model which can be used generally in the analysis of the intellectual capital statement and IPO prospectuses.

**Originality/value** – The paper demonstrates the similarities between an intellectual capital report and an IPO prospectus. Further, the paper demonstrates the use of a theoretically anchored and practical, useful model for analysing disclosure in the narrative part of a financial report.

**Keywords** Denmark, Disclosure, Intellectual capital, Financial analysis

**Paper type** General review

### 1. Introduction

The concerns with firms' external disclosure and reporting has grown substantially in the wake of increased globalization, integration of capital markets and mobility of both monetary and physical resources (Holland, 1997; Beattie, 1999; Beattie and Pratt, 2001). In addition, technological developments and the importance of new business sectors, e.g. IT, and biotechnology, have helped develop an economy where value creation increasingly is related to firms' stock of patents, skilled employees and strategic relationships. This makes disclosure of information about knowledge resources a key challenge (Holland, 2001, p. 6).



These trends follow a growing frustration with traditional financial reports, as expressed already in the “Jenkins Report” (AICPA, 1994) and by the former commissioner of the Securities and Exchange Commission (SEC) Wallman (1995, 1996). Several recent reports (e.g. Eustace, 2001; FASB, 2001; Upton, 2001; Blair and Wallman, 2001) have called for improved disclosure of intangibles and the development of new reporting models and guidelines for sustainability reporting (GRI, 2002) and more specific for reporting of intellectual capital and intangibles (Meritum, 2002; Mouritsen *et al.*, 2003b) has been developed (Bukh and Johanson, 2003).

The purpose of this paper is to suggest and illustrate how new rules for the analysis of intellectual capital statements can be developed. The aim is to show that it is possible to create a set of rules for this analysis that allows a reader first to appreciate the content of an intellectual statement in such a way that he or she can make an independent judgement of its content. And secondly, the aim is to show that it is possible through these rules of analysis to compare different firms’ intellectual capital.

In the paper we analyze an IPO prospectus and an intellectual capital statement, each from a Danish software company, using a framework developed for analyzing external reports (Mouritsen *et al.*, 2001b). Building on this analysis we argue that IPO prospectuses and intellectual capital statements have similarities and that a common framework for the analysis of business reporting can be developed. Thus, the aim of this paper is to develop a set of rules to analyze intellectual capital statements that resemble or are parallel to the principles governing the analysis of financial statements.

The article is structured as follows: Section 2 considers empirical experiences concerning the needs for information by investors and analysts and the proposition that a lack of appropriate rules-of-thumb for comprehending new forms of information poses a problem for the capital market participants. In section 3 the demand for information during an IPO will be described and particular the information disclosed in an intellectual capital statement will be discussed. In section 4, a model for analyzing the information disclosed in intellectual capital statements is presented, and in section 5 this model is used to understand the intellectual capital statement from Systematic Software Engineering A/S, while the IPO prospectus of Navision A/S is analyzed in section 6. Finally, sections 7 and 8 compare the two analyzes and conclude the paper.

## 2. Investors’ and analysts’ information needs

Eccles and Mavrinac (1995), discuss the quality of corporate communication in relation to financial markets. They identify a pronounced reporting expectation gap between companies and the capital market – managers see their communication policy as proactive while financial analysts find it inadequate and reactive. There is an increasing demand for credible, useful and understandable information (Anderson and Epstein, 1996) which is argued to make the capital market more efficient (Gelb and Zarowin, 2002). The demand for new types of information is corroborated by Mavrinac and Boyle (1996) who claim that analysts attribute non-financial information significant value, especially analysts who work with knowledge intensive organizations within the fields of technology and biotechnology (see also Barth *et al.*, 2001). Analysts’ reports about knowledge intensive firms show that aspects concerning the training and education of employees all appear as relevant factors when the future growth potential of an organization is estimated.

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This point is problematized by Beattie (1999; see also Weetman and Beattie, 1999) who indicates an increasing attention to non-financial relations even though this information is weighed lower among analysts, investors and banks than traditional financial information. Information about risk factors and reliable information about management's qualities, expertise, experiences and integrity is in demand as it is deemed as critical success factors (see also Anderson and Epstein, 1996; Bartlett and Chandler, 1997).

These studies suggest that an information gap exists between organizations and capital markets. Financial reporting, which primarily assesses the tangible assets of an organization, is to a certain degree losing value relevance particularly for industrial sectors that are dominated by knowledge intensive and innovative organizations (Lev and Sougiannis, 1996; Amir and Lev, 1996; Joos, 2002) for whom intangible assets create information asymmetries and lack of transparency (Aboody and Lev, 2002; Barth *et al.*, 2001). It appears that in a world of increasing technological development, shorter and shorter product lifecycles and growing integration of capital markets and where intangible values matter more and more, firm performances are better reflected if non-financial indicators are also presented.

The studies also show that there are differences in the demands that investors place on information published by an organization. Anderson (1988) argues that sophisticated investors demand different information from that required by private investors, as they have the training that enables them to comprehend and utilize more complex types of information. However, there is also opposing evidence. Plumlee (2003) finds that even sophisticated and professional decision-makers have difficulties understanding complex information; and Nordberg (2001) find that the capital market participants have difficulties in changing their routines and incorporating new ideas because of their culture and background.

### **3. Towards the stock exchange: the initial public offering**

Prior to an IPO, the organization prepares a prospectus in order to convince private and institutional investors that it is attractive to invest in the company. While the intention of an annual report is to deliver a complete picture of the historical performance of an organization, the prospectus focus on the firms future perspectives, possibilities, and expected financial capacity. Even if there are standards for a prospectus, the information content in financial reports is subject to much more regulation. Only few have analyzed the information content in prospectuses and often with focus on isolated pieces of information. Guo *et al.* (2004), e.g. examined the cost-based determinants of the extent of product related information disclosed by biotech IPOs in their prospectuses.

Mak (1994, 1996) observes that information regarding expectations to future earnings is more common in a prospectus than in annual reports, and in a study of Danish IPO prospectuses from 1990 to 2001, Bukh *et al.* (2005) find significant differences in disclosure between knowledge intensive and traditional industries, the former disclosing far more on intellectual resources than the latter. It may be that on certain dimensions, the IPO prospectus is an interesting model for a more comprehensive form of reporting, as Beattie (1999) accentuates, because a firm is more reflective about its communication in a period where it goes public. An IPO typically includes wide amounts of information on quality, risk, and expectations to the future, issues which all were raised in the seminal "Jenkins Report" (AICPA, 1994) as key elements in a model of comprehensive business reporting.

In this paper we take it as a point of departure that studying an IPO prospectus provides an opportunity to examine which types of information the capital market requires in order to estimate the value of an organization that does not have a market value yet. Even if IPO prospectuses are regulated to a certain degree, there is also a series of degrees of freedom in how companies can exercise their judgment about relevance of information. However, this judgment is performed always against the perceived interests of capital market participants.

During an IPO, an organization informs the market about performance, competencies and growth potential in a manner that will convince the investors that it is reasonable and profitable to invest in the organization. This attempt to attract investors is centred on the prospectus, which explains the results of the organization, its operations, competencies and resources, and intends to give a credible picture of continued growth and potential for the future value growth and profits.

Compared to the annual report, the IPO prospectus is targeted at a slightly different group of readers, namely potential investors and analysts, and not employees, partners, and customers like in the case of annual reports. Hence, a prospectus may have a narrower target group than an annual report, as it is not directed towards customers, suppliers and other collaborators. As the choice of information is based upon the kind of information that the group of readers is expected to demand the content also differs. For instance, a prospectus is aimed at illustrating the present and future advantages of investing in the organization than it is a historical summary of previous periods' financial results, which generally characterizes an annual report. To fulfill these communication and probably also promotional concerns, it is hardly adequate just to inform about historical financial results in the prospectus. As the prospectus is more forward-oriented, it naturally incorporates and discloses considerably more information on the intangible assets of the organization. In the next section a method for the analysis of reports' content of intellectual capital indicators is presented.

#### **4. A model for analyzing intellectual capital disclosure**

When external readers see an intellectual capital statement, they often wonder what is going on. What do intellectual capital statements say and how can we interpret their information content?

It is not easy to answer such questions because an intellectual capital statement is a new phenomenon – both as a document and as a management concept. Although guidelines for developing and analysing intellectual capital statements (e.g. Mouritsen *et al.*, 2003a, b; Meritum, 2002) have been developed, such voluntary reports do not have a historically crafted set of institutions to endorse them. Unlike a financial statement, intellectual capital statements do not have a set of accounting standards; and they are not strongly supported by institutions such as auditors, financial analysts and investors who, by contrast, are accustomed to reading financial statements. Because these statements are such a new phenomenon, we argue that the capital market has not yet developed sufficient rules-of-thumb for the decision-makers to understand their message.

Despite this, intellectual capital statements represent the types of voluntary corporate disclosures that companies to a rising degree are making. Even though the notion of an intellectual capital statement is ambiguous, the statements disclosed in Denmark over almost a decade have shown that it is possible to construct a

comprehensive and meaningful framework for reporting on a company’s intellectual resources and competencies. Intellectual capital statements are reports that via text, indicators and illustrations present the firm’s knowledge management effort (Mouritsen, 2000; Mouritsen *et al.*, 2001a). See Mouritsen *et al.* (2003b) for further details of the content of an intellectual capital statement.

When approaching intellectual capital statements analytically, the possibility of developing a general method for understanding their common features becomes interesting. Stated in another manner, how can we build an accounting system that enables the classification and presentation of intellectual capital indicators? An accounting system for intellectual capital disclosure would need to take the indicators of the intellectual capital statement seriously, which in turn must be classified according to common categories spanning the intellectual capital statements.

Such an accounting system is presented in Figure 1. The information “input” for the analytical model is derived from the report, which is to be analyzed. In the case where an intellectual capital statement is the supplier of information, the input thus becomes the specific indicators representing knowledge narrative, management challenges and activities. The indicators are disentangled from the text of the intellectual capital statement through the analytical model that organizes the indicators according to three general problematizations of the firm (similar to the problematizations of the financial statement): What is the composition of knowledge resources (what is the composition of assets)? What are the activities made to upgrade knowledge resources (which investments are made in the firm)? What are the effects of knowledge resources (what is profitability)? These questions are concerned with the assessment of the firm’s knowledge resources.

These three questions can be raised for all the possible types of containers of knowledge resources such as, e.g. employees, customers, processes and technologies. The list of knowledge resources is neither stable nor final as resources may be added, and resources may over time lose their importance. However, experience shows that at present the four types of knowledge resources mentioned include central knowledge resources to the majority of companies. Adding the assessment questions and the list of knowledge containers together one gets the grid in Figure 1. Each indicator can be placed according to these two criteria. In order to assess if the composition, structure and use of the resources are appropriate, it is necessary to consider the development of the indicators over time (Mouritsen *et al.*, 2003a; Bukh *et al.*, 2001; Mouritsen *et al.*, 2001a, b, 2002).

Evaluation criteria Knowledge resources	Effects What happens	Activities What is done	Resources What is created
Employees	• • •	• • •	• • •
Customers	• • •	• • •	• • •
Processes	• • •	• • •	• • •
Technologies	• • •	• • •	• • •

**Figure 1.**  
Analytical model for reading intellectual capital statements’ indicators

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#### 4.1 Assessment criteria

The assessment criteria of the analysis model are based on indicators attached to the three main questions of the analysis:

- (1) *Resource indicators* concern the portfolio of the company's knowledge resources, i.e. the company's stock and composition of resources within the areas of employees, customers, processes and technologies. These indicators represent the company's "stock" of knowledge resources and reflect "resource pieces" which the company can move around. The indicators deal with relatively stable units such as, e.g. "a customer", "an employee", "a computer", "a process" etc. They answer questions such as "how many?" and "which share?" and thus illustrate how big, how varied, how complex and how correlated the knowledge resources are. The attached management actions are portfolio decisions – i.e. decisions on how many knowledge resources of the different types the company wants.
- (2) *Activity indicators* describe the company's activities to upgrade its knowledge resources, i.e. activities initiated to upgrade, strengthen or develop its resource portfolio. The indicators answer the question "What is being done?", e.g. what does the company do to develop and improve its knowledge resources – through, e.g. continuing education, investments in processes, activities to educate or attract customers, presentations etc. The attached management actions are thus upgrading activities.
- (3) *Effect indicators* reflect the consequences or the total effects of the company's development and use of knowledge resources. As accounting system, the model only shows the effects; it does not seek to explain from where they arise. The analyst on the basis of, but not within the model itself may seek such explanations.

As accounting system, the analysis model is not an input/output-model. No direct connection necessarily exists between actions to develop employees and the effect in that area –, e.g. increased employee satisfaction. The effect of such an action may appear as a customer effect: The employee becomes more qualified and capable of serving the customers better. The task of the analysis is thus to explain these "many-to-many relations" in the model. The classification itself does not explain the relations just as increased expenses for R&D alone do not lead to increased turnover in the financial accounting system.

#### 4.2 Classification of indicators

Ideally, the indicators of the intellectual capital statement already include the information necessary to classify them within both dimensions. The dimensions are so to speak "embedded" in the indicators, which always deal with a certain aspect of a certain type of knowledge resources. This is often the case, but drawing the lines sometimes creates problems. In short, a number of rules-of-thumb are needed – in the same way as accounting standards help classify financial transactions.

When it comes to the resource indicators, grouping the indicators according to knowledge resources normally does not cause difficulties. The activity indicators may cause more confusion because some of the activities function as an upgrading of two (or more) different knowledge resources at the same time, e.g. employees attending courses in process optimization may be an upgrading activity to both employees and



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processes. A rule-of-thumb may be that in such cases the indicator should be placed according to the knowledge resource, which is brought most into focus: Customer group meetings should thus be mentioned under customer resources and not under employee resources. The same applies to presentations at conferences because the company's image (customer resource) is the focus of attention, not the employee resource, even though an employee is giving the presentation etc.

Special problems may also arise when the effect indicators are to be placed in the model because they may concern more than one knowledge resource, e.g. "employee satisfaction with technology" and "customer satisfaction with employee competences". As a rule-of-thumb, the indicator should be classified according to the qualities it describes; meaning that "employee satisfaction with technology" is considered a quality of technology and is thus placed as a technology resource. According to the same principle, "customer satisfaction with employee competences" is placed as an employee resource.

Many intellectual capital statements use abstract categories, which are not suitable for classifying the indicators, e.g. notions such as "innovation", "flexibility", "customer orientation" or "strong culture" – abstract notions that are not actions, but more part of a knowledge narrative. Some companies measure, e.g. "innovation" by "share of turnover originating from new products"; Others use "R&D expenses compared to turnover" or "number of patents" while some assess the employees' formal educational qualifications etc. instead. The notion "innovation" is so broad that it is impossible to say where the "innovation indicators" belong in the model. They should be distributed according to the concrete activities and knowledge resources, which they concern. Turnover from new products is a customer indicator just as the share of customers contributing to high-technology projects. The number of patents is a process indicator and the number of employees with a PhD degree is an employee indicator. The representation of "innovation" is not one single indicator. "Innovation" is a strategy, which should be illustrated by a number of scattered indicators that are to be interpreted as a relation. The same applies to other complex notions such as, e.g. "flexibility", which may also span innumerable types of activities and thus is represented by many different indicators.

In the recent publication "Analysing intellectual capital statements" (Mouritsen *et al.*, 2003b) the analytical model described above is applied on the intellectual capital statements of three organizations. It is demonstrated how a qualitative comparison of such statements can be conducted with the purpose of assisting the capital markets' conceptualization and understanding of knowledge resources' contribution to value creation. This paper moves one step further by applying the analysis model on both an intellectual capital statement and an IPO prospectus, thus vindicating for the possible application of this analysis framework as a possible rule-of-thumb for analyzing and understanding other types of supplementary business reports.

## 5. Analyzing Systematic's intellectual capital statement

Systematic Software Engineering A/S (Systematic) is a Danish software company that develops and sells technical system solutions, products and support primarily to ministries of defence but also increasingly to industrial, as well as transport and service companies. Systematic's intellectual capital statement is a 36-page report whereof the first nine pages are comprised of an introduction to and a description of the

company including its mission, vision and values, along with an extract from its financial statement. The distribution of the indicators disclosed in the intellectual capital statement according to the analytical model, is shown in Tables I-IV.

The intellectual capital statement of Systematic has many indicators in the employee and process categories. With regard to the employee category, attention is

	97	98	99	00	01
<i>Effects (satisfaction)</i>					
Culture	3.9	3.8	4.0		
Immediate management	3.3	3.4	3.6	3.5	3.6
Job assignments	3.6	3.7	3.6		
Top management	3.4	3.5	3.6		
Employee loyalty				4.1	4.2
Management values				3.8	3.9
Employee situation and development				3.7	3.9
Customer relationships				3.6	3.9
Processes and infrastructure				3.5	3.4
Number of unsolicited applications			59		
Absence due to illness	3.4	4.0	3.8	3.8	4.9
Total satisfaction with opportunity for on-the-job skills development	3.6	3.7	3.7	3.8	4.0
Per cent who perceive Systematic as a satisfactory workplace	88	93	95	89	93
Number of software engineers who have resigned	8	11	16	21	18
<i>Activities (development)</i>					
Training days per employee	3.6	5.2	7.8	6.4	8.5
Training investment per employee	11	10	20	11	13.5
<i>Resources:</i>					
Number of employees, total			167		217
Number of employees in Denmark	98	124	137	139	187
Average number of full-time employees			120	130	150
Number of software developers	69	90	103	112	154
Accession of software engineers	22	32	29	26	60
Professional software experience (years in total)	362	485	534	574	775
Professional software experience – average per software engineer	4.8	5	5.2	5.5	5.6
Number of employees who have a Master's or PhD degree		66	69		61
Cola index		104	102	110	129
Average age			32		33
Carrot index				13	15
<i>Number of certified employees:</i>					
Microsoft					
Professional				31	71
Solution developer				0	9
Sun Microsyst.					
Java Programmer				22	63
Java Developer				0	5
Oracle					
Database Adm.				2	5
Developer				4	8
Number of active project customers	23	26	28	32	36

**Table I.**  
Employees



	97	98	99	00	01	Intellectual capital statements
<i>Effects:</i>						
Number of new strategic project customers	3	3	3	3		
Number of customers who participated in the IRIS conference	59	115	144			
Duration of customer relationships:						
0-3 years	13	15	16	18	21	
4-6 years	5	6	5	7	7	
7-13 years	5	5	7	7	8	
Number of guests who visited Solveig's lunch buffet			776		1,225	
Total customer satisfaction				4.2		
Pct. of customers that would recommend Systematic				97		
<i>Resources:</i>						
Number of active project customers in defence	9	8	8	7	10	
Number of active project customers in non-defence	14	18	20			
Per cent of project turnover to non-defence customers	23	39	52			
Number of licences sold	241	11,629	1,603			
Turnover (mio.)	62	80	88	103	133	
Growth rate in turnover	32	29	10		30	
The five largest project customers – pct. of turnover	77	73	63	65	48	
The five largest licence sales (percentage of licence turnover)	66	60	47	30	24	
Number of countries where defence uses IRIS			23	26	26	
Active project-customers in the health sector			0	2	3	
Average turnover per active project customer					2.7	
Distribution of active project customers according to number of project hours:						
0-1,000					2	
1,000-2,500					9	
2,500-5,000					11	
5,000-10,000					23	
> 10,000					55	
Number of requirements in the <i>Business Manual</i> :					1,741	
CMM					1,247	
ISO 9001:2000					180	
Aqap 110 and 150					314	

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**Table II.**  
Customers

directed towards resource issues, for example concerning the attraction and retention of key employees, which is backed up by effect measures in relation to employee satisfaction. The process category is described largely from the effect column, and these performance indicators are backed by a series of qualifying activities. This illustrates that Systematic is paying attention to building organizational processes that can help the execution of the complex projects (CMM measures). As is evident, Systematic focuses on improving process maturity and on attracting employees, which explains why a significant proportion of its intellectual capital indicators are found in these categories.

By structuring Systematic's intellectual capital indicators according to this model, it appears that firstly, in terms of the resources column, Systematic to a great extent describes its knowledge resources in terms of the spread of employee qualifications and in terms of relations to customers. For processes, it appears that Systematic is

**Table III.**  
Processes

	97	98	99	00	01
<i>Effects</i>					
Average maturity level according to the Bootstrap model	2	2.3	2.5	2.5	
Customer satisfaction with quality		3.9			
Telephone service index (%)		92	95		
Pizza-index		17	11	7	7
Employee satisfaction with quality and efficiency of processes		3	3.2		
Employee satisfaction with "Project time allocated to process development"			2.9	3.1	3.3
<i>Activities</i>					
Number of internal hours spent on process improvements (thou. of hours)	1.2	3.2	4.3	4.8	10.8
Investment in product development (mio. Kr.)	3.3	6.7	7.5	11.4	9.7
Investment in process improvement (mio. Kr.)	0.5	1.3	1.7		
Total investment in innovation as a percentage of group turnover	6.1	10.2	10.3		10.9
Total investment in innovation (mio. Kr.)	3.8	8	9.2		14.4
Number of measurements on the course and development of projects					70
<i>Resources</i>					
Number of PCs/workstations per employee	1.3	1.4	1.8		

**Table IV.**  
Technology

	97	98	99	00	01
<i>Effects:</i>					
Bicycle index		43	50	49	48
Employee satisfaction with "office premise"	4.1	3.7	3.1		3.0
<i>Resources:</i>					
Number of servers in network	13	19	32		
Office space in 1,000 m <sup>2</sup>	2.0	2.7	2.7	2.7	5.7

more concerned with portraying the activities performed in relation to upgrading and investing in process efficiency and to describe effects in terms, e.g. of a CMM indicator that portrays the quality of Systematic's software project management routines.

The lack of comparable indicators in the activity column for all the categories of knowledge resources in Systematic's intellectual capital statement is met by texts of the activities performed (see Table V). These are, e.g. a part of Systematic's concern for process efficiency, and in respect to developing employees. Also, there are a number of activities pertaining to the customer category. As was evident, this category had no comparable performance measures, which could indicate that Systematic lacked market focus. However, despite this tension between the descriptions of initiatives and the set of qualitative indicators provided in the intellectual capital statement, the activities illustrated that Systematic did focus on its customers although it did not have any suitable measures for such initiatives.

SSE	Effects	Activities	Resources
Employee		Activities concerning employees' wellbeing Attract the best employees through presentations at universities Employee certification Project briefing and debriefing activities Course activities	
Customer		Appraisal interviews "Meet the customer" project Annual performance dialogue with customers/focus on customer satisfaction Customer involvement in project development Visits by/at customers Participation at international seminars	
Process	ISO 9001 and AQAP certification	Implement <i>Business Manual</i> Knowledge agents on processes Process measurement and automatic data capture User group seminars; understanding of customer needs	
Technology			

**Table V.**  
Systematic's activities  
organized according to  
the analytical model

This disentangled representation of Systematic helps us to talk about its knowledge management concerns in a general and analytical language partly detached from the intricacies of Systematic itself. It is clear that Systematic somehow attends its orientation towards the interplay between employees, processes, technology and customers. The indicators do not convey this insight in themselves (just like the financial statement does not really reveal where financial results come from) but they help to suggest that many types of managerial actions can be initiated to develop knowledge resources (portfolio management, investment management, and supervision of effects), and it help pointing out the knowledge resources on which these three types of management can be performed.

The relationships between the different types of knowledge resources are characterized more as network links than by causal links. For example, if there were no new employees, the effort to strengthen project management skills would not be as important as it was because there would be less inexperienced resources to integrate. If users and customers were stable there would be no need to develop customer relationships, and there would – in turn – be no need to develop organizational skills in quality and project management because there would be a finite set of services and products to be shipped. Overall, the analysis indicates that Systematic is in a phase of development and growth and that its knowledge management activities therefore are concerned with creating a stable base from which to compete.

## 6. Analyzing Navision's IPO prospectus

Navision A/S is a Danish software company that develops and distributes software applications for financial and management accounting, ranging from comprehensive ERP systems to standard bookkeeping applications. The group was founded in 1994 and had grown to 346 employees in 1999 when it was introduced on the Danish stock

exchange[1]. Navision's IPO prospectus is a 112-page report of which approximately 50 pages are comprised of text describing how the company creates value.

Navision, like Systematic, is considered a knowledge-intensive organization as its success predominantly is based on human capital in the form of, e.g. skilled software engineers and competent researchers and employees. In Tables VI-IX, the indicators

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	94	95	96	97	98
<i>Effects:</i>					
Net revenue per employee	967	887	937	1,064	1,160
Staff turnover in pct.			14	14	13
<i>Activities:</i>					
Investment in personnel	16,382	33,998	38,935	50,114	89,497
<i>Resources:</i>					
Number of employees	39	74	93	127	223
Number of full-time employees including overseas employees (ca.)	50	80	100	150	250
Number of employees in product development					132
Staff breakdown by departments	Yes	Yes	Yes	Yes	Yes
Staff breakdown by age					Yes
Staff breakdown by nationality					Yes
Staff breakdown by type of education					Yes

**Table VI.**  
Employees

	94	95	96	97	98
<i>Activities:</i>					
Number of Navision solution centres		190			700
<i>Resources:</i>					
Number of customers	14,500	18,000	22,000	27,500	31,000
Turnover (Mill. Dkr)	38	66	87	135	259
Growth rate in turnover (%)	29.2	73.9	32.8	55.0	91.5
Sales breakdown by segments (%)	31				69

**Table VII.**  
Customers

	94	95	96	97	98
<i>Activities:</i>					
R&D expenses	13,656	21,738	21,100	29,032	52,751
R&D expenses/sales	36.3	33.1	24.2	21.5	20.4
<i>Resources:</i>					
Number of strategic partners	190	270	400	620	710

**Table VIII.**  
Processes

	94	95	96	97	98
<i>Effects:</i>					
% of sales from licences for windows-based systems				10	70
<i>Resources:</i>					
Sqm office space					9,000

**Table IX.**  
Technology

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provided in the IPO prospectus of Navision A/S[2] are arranged according to the analytical model. A brief comparison with the corresponding analysis of Systematic's intellectual capital statement points out a set of similarities between information conveyed through an intellectual capital statement and the information produced and disseminated in connection with an IPO prospectus.

The IPO prospectus indicates that the spread of knowledge resources can be indicated as a constellation of a portfolio of employees, customers and knowledge sharing technologies including organizational arrangements and partnerships; of investments in R&D and technology; and of a limited set of effects. There are more items pertaining to the portfolio of knowledge resources and of investment propositions than effects. These indicators are about the way the firm is capable and oriented towards a future not yet defined clearly in temporal forms.

From the three columns of indicators it is possible to argue that the company is in an expansive phase where resources in relation to the employee and customer dimension are growing. The number of employees is growing steadily and at the same time Navision is maintaining a stable percentage of production staff in relation to total number of employees. The indicators also illustrate that the number of customers is growing while the average size of the customers is increasing at the same time. This might indicate that Navision is in the process of entering into a higher end segment. Alternatively, the company is getting better at selling additional products and services to the existing customer-base. The fact that the number of strategic partners has been rising over the period might support the high-end movement interpretation.

In relation to the activity column, Navision includes a series of measures pertaining to investments, e.g. in personnel, R&D, IT and office equipment. All the activity measures contained in Navision's IPO prospectus are in monetary terms, i.e. there are no non-financial performance measures focusing on activities. Therefore, Navision probably does more than it measures, e.g. in relation to customer contacts, employee performance reviews and negotiations etc.

The effect column contains only three measures. First, net revenue pr. employee might indicate achieved efficiency in relation to sales and production processes. However, Navision does not couple this measure to a story or strategy of process efficiency as was the case with Systematic. Staff turnover is an important measure in relation to Navision's managerial focus on developing and retaining employees. The fact that there is a decrease in staff turnover indicates that this managerial focus is paying off. The third measure in this column pertains to the percentage of Navision solutions that are Windows-based. Navision states that the ability to interface their systems with existing IT platforms is a key to future success. This measure thus confirms that Navision takes this challenge seriously. In retrospect, it may seem amusing that Navision should use precisely this "Windows-measure". Perhaps it was management's hidden agenda to be sold to Microsoft already in 1999?

So, the numbers provided by Navision link aspects such as: highly qualified professionals, software programmers and engineers, and complex relationships with partners, with a series of organizational designs oriented towards a knowledgeable firm, ultimately relating these to investments in R&D. The IPO prospectus also discloses information regarding incentive systems, training programs and measures of staff turnover. Thus, Navision gives the impression of not only trying to maintain its critical human resources and competencies but also to further qualify and up-grade these – more importantly also indicating that a too high staff turnover will be problematic with regard to

sustaining value creation. The effects and monitoring of effects of the resource and qualifying activities categories are, measured by net revenue per employee and staff turnover. However, effects are primarily included in the form of descriptions of dependence on key employees, customers and distribution partners in the text of the prospectus.

As is evident from Table X, where the activities described in Navision's IPO prospectus can be characterized according the analysis model, the company seemingly does more than it has indicators for. For example, by describing activities relating to gathering feedback from customers, securing intellectual property rights, and product development processes, Navision helps us in understanding how indicators such as "Number of employees in product development", "R&D expenses" and "Annual growth in R&D expenses" become important. Together, these indicators and activities describe Navision's efforts in relation to maintaining and extending technological leadership.

Another example of how activities and indicators support each other relates to Navision's efforts in extending its network of certified partners. Descriptions of the network of suppliers and distributors and descriptions of Navision's network partner concept, the "Navision Solution Center Program" are supported by an indicator of the number of Navision solution centres worldwide. Although Navision's efforts here are concerned with securing consistency in the quality of the solutions offered within the network, surprisingly there are no performance indicators that illustrate whether they have succeeded in this.

However, Navision does try to verify the quality of their solutions by describing how the combination of skilled software engineers and innovative technological development ensures reliable and stable programs; characteristics, which are important because users make key decisions on the basis of information from a software system. This analysis indicates that there was a tension between the performance indicators provided and the initiatives carried out by Navision, which were present in the prospectus in the form of text and descriptions. For example, the prospectus contained detailed descriptions of how the company was dependent on key employees and how the presence of incentive systems related to this. However, there were no measures of this dependence, leaving the reader without a clue as to whether the incentive systems worked or whether this dependence was a rising problem or becoming irrelevant as the company grows in size. Another possibility for Navision would be to describe and measure efforts relating to knowledge sharing activities designed to minimize the dependence on key employees. In short, the prospectus contained much more descriptive text in comparison to actual performance measures.

The Navision prospectus is not representative for all Danish IPO prospectuses, because Navision is a very research oriented firm. However, from a study of Danish IPO prospectuses over a period of 12 years (see Bukh *et al.*, 2005) it seems as if the tendency towards an increasing disclosure of intellectual capital information in prospectuses is a general trend. The information content in prospectuses of the past few years contain just as much information about customers, employees, R&D and processes as the most extensive intellectual capital statements. Not surprisingly, the overlap is particularly noticeable for firms heavily based on knowledge, e.g. in the pharmaceutical, research, and technology sectors.

## 7. Comparison

The analyzes of Systematic's intellectual capital statement illustrates that Systematic is moving towards increasingly systemized processes. The axis is the development of



NAVISION	Effects	Activities	Resources
Employee	Dependence on key employees	Incentive systems Training and education program: "Navision Solution Center Program"	
Customer	Dependence on key customers Dependence on distribution partners Dependence on independent partners' relationship	Navision Academy Program for recruiting, training and certifying human resources at network partners Feedback from customers Education and training of customers Description of distribution strategy	Network of suppliers and distributors Network partner concept: Navision Solution Center Program
Process		Feedback from network of partners Strategy of R&D activities	Description of network of suppliers and distributors
Technology		Efforts focused on product development and expansion of products Product development process Investment in IT Office expenses, including computer expenses Procedures to protect intellectual property rights Formulated strategies for maintaining and extending technology leadership	Cross-functional teams Internal sharing of knowledge Description of IT systems

**Table X.**  
Navision's activities  
organized according to  
the analytical model

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the company's project management system, which requires training and education of the rapidly increasing workforce. This specific focus suggests that Systematic's ability to deliver high quality products on time necessitates standardized processes, i.e. a higher level of maturity in the CMM-model. In addition to the detailed descriptions of the work in relation to the CMM certification, this focus is emphasized in the intellectual capital statement through a number of indicators in relation to process development. For example, the number of hours used on process development has risen by over 900 percent between 1997 and 2001, while the costs in the same period merely rose by a three-fold from € 0.44 million to € 1.3 million.

The effects of process development are evident in a number of indicators disclosed in Systematic's intellectual capital statement. These indicators will eventually be expressed through high quality products and thereby in the long run measurable through customer satisfaction. Product quality is difficult to define and measure. Systematic tried such a measure in 1998, but has not measured it since. Likewise, Systematic conducted a one off customer satisfaction survey in 2000[3].

The similar analysis of Navision's IPO prospectus shows that this firm relies heavily on recruiting, retaining and developing qualified employees who are viewed as the principal drivers of value creation because they are the key to: sharing knowledge with business partners, attracting business partners, and entering into strategic relationships. Also, the analysis of Navision illustrates that designing solutions to maintain and extend technological leadership is a key management priority. Realizing the importance of being able to integrate solutions with other software providers, Navision illustrates that the pct. of Navision's systems that are based on Windows NT server has risen from 10 percent in 1995 to 70 percent in 1998. Despite a steady growth in R&D expenses over the last five years with an annual growth of between – 3 percent and 82 percent in R&D expenses, the R&D expenses relative to sales have fallen from 36.3 percent to 20.4 percent. The question remains whether this is due to less focus or better efficiency in the R&D process. Unfortunately, Navision does not provide any indicators to substantiate this dilemma.

This analysis of the two reports shows how intellectual capital statements and IPO prospectuses can be compared. The comparison is obviously a general one. However, it illustrates that conclusions drawn about individual companies can (with a little creativity) be brought together with conclusions about other companies through the analysis model framework, independent of the fact that they do not necessarily release the same kinds of reports. The analysis does, however, pinpoint what has to be done to make such a comparison work. Comparison is dependent on the ability to express each company in a statement that is more general than the indicators and words in its intellectual capital statement, IPO prospectus or for that matter any other type of supplementary business report or the annual report. In this manner, the analytical model applied in this paper constitutes a new method for analyzing existing types of reporting; it represents a new rule-of-thumb for organizing and understanding new types of information. Rather than utilizing an existing analysis method in relation to new types of reporting, our analysis suggests that a new tool may help users of corporate reporting understand companies' voluntary disclosure.

It may be the case that a reader would disagree with the sensibility of Systematic's or Navision's strategic priorities and it may be that management of the two firms would disagree that the analysis points out the right strategic priorities, i.e. that they

do not accept the interpretations. But this is a “good” quality of the analytical model because then it just helps the reader to conduct this evaluation. The analytical model may make it possible to “look through” the claims of the firm producing the statement.

Having separated the indicators from the context of the report, the indicators are allowed to speak for themselves, both singularly and in combinations with each other, because they provide associations to the reality they represent. Take for instance Systematic’s listing of “Sqm of office space” in combination with “Number of employees”. For the arguments behind the indicators to come alive, their significance must be analyzed. In our example, this could lead us to consider possible effects of a substantial growth in the number of employees and no expansion of the office space. What is for example the trend with regard to “Employee satisfaction with physical surroundings”? This analytic process helps test the story of how knowledge relates to value creation in the case of the intellectual capital statement. More generally speaking, the analysis should be related specifically to the company’s particular situation. On this point, the analysis and comparison of intellectual capital statement and IPO prospectus indicators are fully parallel to that of financial statement indicators. It is this, which gives meaning to the total picture of the company.

The analytical method’s goal is to create sufficient distance between the indicators and activities that a company has chosen to present in its supplementary business report and the context in which it is presented, i.e. its text and illustrations. The indicators are via the analysis model’s evaluation criteria dimension categorized in such a way that three general questions can be answered. Table XI shows that the same types of questions are found in financial statement analysis.

Obviously, our knowledge of the financial statement is so much greater than our knowledge about intellectual capital statements that there is a huge difference in the number of possible analytical angles between the two types of statements. As Table XI shows, insights into financial assets becomes insight into the constellation of knowledge resources in the intellectual capital statement; insight about investments becomes insight about upgrading knowledge resources in intellectual capital statements; and insights into performance becomes insights into effects of knowledge in intellectual capital statements.

Reading the intellectual capital statement and the IPO prospectus through the analytical framework presented in this article, provides the reader with a portfolio of indicators and activities. It does not state whether these necessarily are correct, and the analysis of these elements may allow a reader to form an opinion; not always in accordance with the aspirations sought by the firm. A critical evaluation is therefore dependent on the reader’s ability to systematically analyze the information provided, i.e. an analysis based on statement indicators. The goal of such an analysis is to

Intellectual capital statements	Financial statements
What the company’s knowledge resources comprise?	What are the company’s assets and liabilities?
What has the company done to strengthen its knowledge resources?	What has the company invested?
What are the effects of the company’s knowledge work?	What is the company’s return on investment?

**Table XI.**  
Central questions when  
interpreting  
intellectual/financial  
statements

evaluate whether the information provided by the company is relevant and whether the developments in the company's activities are reasonable.

### 8. Concluding remarks

In general, it has been argued that new types of information disseminated through business reporting are unreliable and irrelevant. We propose that this is not necessarily due to the fact that the capital market does not find new types of information interesting in a singular form, but rather that there does not exist an appropriate framework within which to interpret them. Therefore, instead of trying to apply an existing analysis framework, e.g. from financial reporting practices to new types of information, we have illustrated that a new framework for new types of reporting also can be applied to existing types of reporting that the capital market already is familiar with as well. In this manner, the analytical model represents a new rule-of-thumb that is applicable to the types of information outside the realm of the financial statement, regardless of whether it is disclosed through new forms of reporting or existing reporting practices.

### Notes

1. In 2002 Microsoft Corporation bought Navision whereupon its name was changed to Microsoft Business Solutions.
2. The analysis of Navision A/S is based on the preliminary offering circular dated February 26, 1999.
3. A highly alternative indicator disclosed by Systematic is the Pizza-index. It measures the number of pizzas ordered per employee per year has declined consistently over the last four years. The importance is that it reflects overtime on tight projects, and seeing it decrease allows the conclusion that Systematic has become better at project planning, in turn indicating better process control.

### References

- Aboody, D. and Lev, B. (2002), "Information asymmetry, R&D and insider gains", *The Journal of Finance*, Vol. 55 No. 6, pp. 2747-66.
- American Institute of Certified Public Accountants (AICPA) (1994), *Improving Business Reporting – A Customer Focus: Meeting the Information Needs of Investors and Creditors; A Comprehensive Report of the Special Committee on Financial Reporting*, American Institute of Certified Public Accountants, New York, NY.
- Amir, E. and Lev, B. (1996), "Value-relevance of non-financial information: the wireless communication industry", *Journal of Accounting and Economics*, Vol. 22 No. 1, pp. 3-30.
- Anderson, M.J. (1988), "A comparative analysis of information search and evaluation behaviour of professional and non-professional financial analysts", *Accounting, Organizations and Society*, Vol. 13 No. 5, pp. 431-46.
- Anderson, R.H. and Epstein, M.J. (1996), "The usefulness of corporate annual reports to shareholders in Australia, New Zealand, and the United States: an international comparison", *Studies in Managerial and Financial Accounting*, Vol. 4.
- Barth, M.E., Kasznik, R. and McNichols, M.F. (2001), "Analyst coverage and intangible assets", *Journal of Accounting Research*, Vol. 39 No. 1, pp. 1-34.
- Bartlett, S.A. and Chandler, R.A. (1997), "The corporate report and the private shareholder: Lee and Tweedie 20 years on", *British Accounting Review*, Vol. 29 No. 2, pp. 245-61.

- 
- Beattie, V. (1999), *Business Reporting: The Inevitable Change*, The Institute of Chartered Accountants of Scotland, Edinburgh.
- Beattie, V. and Pratt, K. (2001), *Business Reporting: Harnessing the Power of the Internet for Users*, Institute of Chartered Accountants of Scotland, Edinburgh.
- Blair, M. and Wallman, S. (2001), *Unseen Wealth*, Brookings Institution, Washington DC.
- Bukh, P.N. and Johanson, U. (2003), "Research and knowledge interaction: guidelines for intellectual capital reporting", working paper, The Aarhus School of Business, Aarhus.
- Bukh, P.N., Larsen, H.T. and Mouritsen, J. (2001), "Constructing intellectual capital statements", *Scandinavian Journal of Management*, Vol. 17 No. 1, pp. 87-108.
- Bukh, P.N., Nielsen, C., Gormsen, P. and Mouritsen, J. (2005), "Disclosure of intellectual capital indicators in Danish IPO prospectuses", *Accounting, Auditing & Accountability Journal*, Vol. 18 No. 6, pp. 713-32.
- Eccles, R. and Mavrinac, S. (1995), "Improving the corporate disclosure process", *Sloan Management Review*, Summer, pp. 11-25.
- Eustace, C. (2001), *The Intangible Economy: Impact and Policy Issues, Report of the High Level Expert Group on the Intangible Economy*, EU Commission, London.
- Financial Accounting Standard Board (FASB) (2001), *Business Reporting: Insights into Enhancing Voluntary Disclosures, Steering Committee Business, Reporting Research Project*, Financial Accounting Standard Board, Norwalk, CT.
- Gelb, D.S. and Zarowin, P. (2002), "Corporate disclosure policy and the informativeness of stock prices", *Review of Accounting Studies*, Vol. 7 No. 1, pp. 33-52.
- GRI (2002), *Reporting Guidelines*, Global Reporting Initiative, Boston, MA.
- Guo, R., Lev, B. and Zhou, N. (2004), "Competitive costs of disclosure by biotech IPOs", *Journal of Accounting Research*, Vol. 42 No. 2, p. 319.
- Holland, J. (1997), *Corporate Communications with Institutional Shareholders: Private Disclosures and Financial Reporting*, Institute of Chartered Accountants of Scotland, Edinburgh.
- Holland, J. (2001), "Corporate value creation, intangibles and disclosure", working paper, Department of Accounting and Finance, University of Glasgow.
- Joos, P. (2002), "Explaining cross-sectional differences in market-to-book ratios in the pharmaceutical industry", working paper, William E. Simon Graduate School of Business Administration, University of Rochester, Rochester, NY.
- Lev, B. and Sougiannis, T. (1996), "The capitalization, amortization, and value-relevance of R&D", *Journal of Accounting Research*, Vol. 21 No. 3, pp. 107-38.
- Mak, Y.T. (1994), "The voluntary review of earnings forecast disclosed in IPO prospectuses", *Journal of Accounting and Public Policy*, Vol. 13 No. 4, pp. 141-58.
- Mak, Y.T. (1996), "Forecast disclosure by initial public offering firms in a low-litigation environment", *Journal of Accounting and Public Policy*, Vol. 15 No. 2, pp. 111-36.
- Mavrinac, S. and Boyle, T. (1996), "Sell-side analysis, non-financial performance evaluation, and the accuracy of short-term earnings forecasts", The Ernst & Young Center for Business Innovation, Cambridge, MA.
- MERITUM (2002), "Fundación Airtel Móvil", in Cañibano, L., Sanchez, P., Garcia-Ayuso, M. and Chaminade, C. (Eds), Eastbourne, available at: [www.eu-know.net](http://www.eu-know.net)
- Mouritsen, J. (2000), "Valuing expressive organisations: intellectual capital and the visualisation of value creation", in Schultz, M. (Ed.), *The Expressive Organisation: Connecting Identity, Reputation and the Corporate Brand*, Oxford University Press, Oxford, pp. 208-29.

- Mouritsen, J., Larsen, H.T. and Bukh, P.N. (2001a), "Intellectual capital and the 'capable firm': narrating, visualising and numbering for managing knowledge", *Accounting, Organisations and Society*, Vol. 26 No. 7, pp. 735-62.
- Mouritsen, J., Bukh, P.N., Larsen, H.T. and Johansen, M.R. (2002), "Developing and managing knowledge through intellectual capital statements", *Journal of Intellectual Capital*, Vol. 3 No. 1, pp. 10-29.
- Mouritsen, J., Larsen, H.T., Bukh, P.N. and Johansen, M.R. (2001b), "Reading an intellectual capital statement: describing and prescribing knowledge management strategies", *Journal of Intellectual Capital*, Vol. 2 No. 4, pp. 359-83.
- Mouritsen, J., Bukh, P.N., Johansen, M.R., Larsen, H.T., Nielsen, C., Haisler, J. and Stakemann, B. (2003a), *Analysing Intellectual Capital Statements*, Danish Ministry of Science, Technology and Innovation, Copenhagen, available at: [www.vtu.dk/icaccounts](http://www.vtu.dk/icaccounts)
- Mouritsen, J., Bukh, P.N., Flagstad, K., Thorbjørnsen, S., Johansen, M.R., Kotnis, S., Larsen, H.T., Nielsen, C. and Kjærgaard, I. (2003b), *Intellectual Capital Statements – The New Guideline*, Danish Ministry of Science, Technology and Innovation, Copenhagen, available at: [www.vtu.dk/icaccounts](http://www.vtu.dk/icaccounts)
- Norberg, P. (2001), *Finansmarknadens amoralitet och det kalvinska kyrkorummet – en studie i ekonomisk menatlitet och etik*, The Economic Research Institute, Stockholm School of Economics, Stockholm (in Swedish).
- Plumlee, M.A. (2003), "The effect of information complexity on analysts' use of that information", *The Accounting Review*, Vol. 78 No. 1, pp. 275-96.
- Upton, W.S. (2001), *Business and Financial Reporting: Challenges from the New Economy*, Special Report, Financial Accounting Standard Board, Norwalk, CT.
- Wallman, S. (1995), "The future of accounting and disclosure in an evolving world: the need for dramatic change", *Accounting Horizons*, Vol. 9 No. 3, pp. 81-91.
- Wallman, S. (1996), "The future of accounting and financial reporting Part II: the colorized approach", *Accounting Horizons*, Vol. 10 No. 2, pp. 138-48.
- Weetman, P. and Beattie, V. (1999), *Corporate Communications: Views of Institutional Investors and Lenders*, The Institute of Chartered Accountants of Scotland, Edinburgh.

### Further reading

- Blunt, M. (2000), *How to Read a Prospectus: A Guide for Beginning Investors*, Missouri Securities Division of the Office of the Secretary of State, Jefferson City, MO.
- Boone, J. and Raman, K.K. (1999), "Off-balance sheet R&D assets and market liquidity", working paper, Mississippi State University, Mississippi State, MS.
- Dietrich, J.R., Kachelmeier, S.J., Kleinmuntz, D.N. and Linsmeier, T.J. (2000), "Market efficiency, bounded rationality and supplemental business reporting disclosures", *Journal of Accounting Research*, Vol. 39 No. 2, pp. 243-68.
- Edvinsson, L. and Malone, M.S. (1997), *Intellectual Capital*, Piatkus, London.
- Roos, J., Roos, G., Dragonetti, N.C. and Edvinsson, L. (1997), *Intellectual Capital: Navigating the New Business Landscape*, Macmillan Press Ltd, London.
- Stewart, T.A. (1997), *Intellectual Capital*, Nicholas Brealey Publishing, London.