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DIPLOMARBEIT

Titel der Diplomarbeit

A Decision Model for the Implementation of Intellectual Capital Reporting on the Basis of Compliance

Designed for Knowledge Managers of Small and Medium-sized Businesses for the
Purpose of Value Optimization

Verfasserin

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angestrebter akademischer Grad

Magistra der Sozial- und Wirtschaftswissenschaften

(Mag. rer. soc. oec.)

Wien, 2012

Studienkennzahl lt. Studienblatt

Studienrichtung lt. Studienblatt

Betreuer:

A 157

Diplomstudium Internationale Betriebswirtschaft

o.Univ.-Prof. Dr. Dimitris Karagiannis

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List of Abbreviations

AIT	Austrian Institute of Technology
AMEX	American Stock Exchange
ARC	Austrian Research Centers
BSC	Balanced Scorecard
CC	Customer Capital
CEA	Comité Européen des Assurances (in English "European Insurance and Reinsurance Federation")
CEO	Chief Executive Officer
Cf./cf.	Confer/confer
CFO	Chief Financial Officer
CIV	Calculated Intangible Value
CM	Compliance Management
COBIT	Control Objectives for Information and related Technology
COSO	Committee of Sponsoring Organizations of the Treadway Commission
EEA	European Economic Area
EU	European Union
EUR	Euro(s)
EVA	Economic Value Added
FASB	Financial Accounting Standards Board
FATCA	Foreign Account Tax Compliant Act
GAAP	Generally Accepted Accounting Principles
G10	Group of Ten
HC	Human Capital
HCM	Human Capital Monitor
HIPAA	Health Insurance Portability and Accounting Act
HR	Human Resources

HRA	Human Resource Accounting
HVA	Holistic Value Approach
IAS	International Accounting Standards
IASB	International Accounting Standards Board
IC	Intellectual Capital
ICBS	Intellectual Capital Benchmarking System
ICM	Intellectual Capital Management
ICRB	Intellectual Capital Report Benchmarking
ICT	Information and Communications Technology
IC-dVal	Intellectual Capital Dynamic Value
IDE	Intangibles Driven Earnings
IFRS	International Financial Reporting Standards
IRS	Internal Revenue Service
ISACA	Information Systems Audit and Control Association
IT	Information Technology
KM	Knowledge Management
KonTraG	Gesetz zur Kontrolle und Transparenz im Unternehmensbereich (in English "Corporate Sector Supervision and Transparency Act")
MiFID	Markets in Financial Instruments Directive
MVA	Market Value Added
NCI	National Cancer Institute
NYSE	New York Stock Exchange
OC	Organizational Capital
OECD	Organization for Economic Co-operation and Development
OMG	Object Management Group
p.	page
PCAOB	Public Company Accounting Oversight Board
PIMS	Profit Impact Market Strategy
RC	Relationship Capital
ROA	Return On Assets
R&D	Research & Development
s.	slide
SC	Structural Capital

SEC	Securities and Exchange Commission
SECI	Socialization, Externalisation, Combination/Creation and Internalization
SMB	Small and Medium-sized Business
SME	Small and Medium-sized Enterprise
SOX	The Sarbanes-Oxley Act of 2002
UK	United Kingdom
UPC	Universitat Politècnica de Catalunya (in English "Polytechnic University of Catalonia")
US	United States
USA	United States of America
VSE	Vienna Stock Exchange
WBV 2010	Wissensbilanz-Verordnung 2010 (in English "Regulation on the Intellectual Capital Statement of 2010")

Chapter 1

Introduction to the Topic

*"Ideas Are Capital. The Rest Is Just Money."*¹

Compliance understood as the adherence to certain rules of economical behaviour has been common in commerce for hundreds of years. Within the wake of globalization though, Günter Müller², a German specialist in information technology, argues that the concept of compliance broadened significantly. He names three big changes: the dimension of caused damages if regulations are not complied with, the supranational influences of these damages, and how transparency can be guaranteed in nowadays automated information systems.

In the last decade a long list of financial and corporate scandals all over the world showed the extent and the various implications of named damages. Research on the internet revealed a few renowned examples. Besides others, these are the ones of:

- Roche, Switzerland, 1999 (and already in 1973), illegal price fixing;
- FlowTex, Germany, 2000, credit fraud;
- Enron, United States, 2001, accounting fraud;
- WorldCom, United States, 2002, accounting fraud;
- Parmalat, Italy, 2003, accounting fraud;
- AIG, United States, 2004, accounting fraud;

¹Advertisement for Deutsche Bank in the Wall Street Journal, by Deutsche Bank, 2001.

²Cf. Müll07.

- BAWAG, Austria, 2006, accounting fraud;
- Bernard L. Madoff Investment Securities LLC, United States, 2008, accounting fraud;
- and Lehman Brothers, United States, 2010, accounting fraud.

As a result new regulations and standards for compliance, like BASEL III or the Sarbanes-Oxley Act (SOX), were published. After the implementation of SOX and other regulations further corporate scandals still happened, hence laws and standards are and have to be the cause of further development. Another sound reason for this is also the huge global financial crisis the world has still to be dealing with. This slump was caused by a liquidity shortfall in the United States banking system in 2007. Like Brian J. Kinman, PwC consultant specialized in Sarbanes-Oxley compliance, depicts it: "The regulatory impact is still being felt across Europe and the rest of the world and is likely to result in a level of change to regulatory and compliance mandates not seen since those emanating out of the economic hey-day preceding the great depression of the 1930s."³ The extension of the term compliance and the introduction of further regulations forced companies and institutions to create new roles and appoint adequate personnel who become more and more crucial.⁴

But staff is not only vital in this field of activity, in the meantime knowledge as a whole contributes much more to the success of a company than ever before. The US (United States) American Thomas A. Stewart, pioneer of intellectual capital, already expressed that in the 1990s when he said that "[the] [...] Industrial Age [...] is gone, supplanted by the Information Age."⁵ This change manifests itself in the transfer from manufacturing simpler to fabricating more complex, "intelligent" products (while automating or outsourcing the production of the former if dealing with them still) as well as in the general shift from selling products to offering services.⁶ These products and services comprise to some extent "[...] applications of customization [which] require knowledge on diverse customer needs and preferences. [This fact goes together with an] acceleration of technical change [which as well] requires KM⁷."⁸ Stewart deducts from this: "[b]ecause knowledge has become the single most important factor of production [– in distinction to capital, land or labour in the

³Menz06, p. V.

⁴Cf. EdWo05.

⁵Stew97, Foreword x.

⁶Cf. Mutc08.

⁷KM is the abbreviation of "Knowledge Management".

⁸BeTi08, p. 4.

Industrial Age –], managing intellectual assets has become the single most important task of business."⁹ A few years later, he extended this statement by saying that "[t]he companies that master the knowledge agenda are the companies that will triumph in the twenty-first century. Because [...] knowledge has become the most important factor of production and [therefore] knowledge assets the most powerful producers of wealth [...]"¹⁰. Moreover, knowledge itself is a major asset in each of today's businesses. Regulatory compliance experts Terence Sheppey and Ross McGill share this view when stating: "[i]f information is the new currency of business and its possession represents wealth, then the contemporary organization must make every effort to acquire and protect it. [...] [T]he significance of intellectual property as the key company asset, on a par with its human resources [...]"¹¹ has been recognized.

Besides "[t]he structural change from labour- and capital-intensive activities to information- and knowledge-intensive ones [...]"¹², as Klaus North argues, the globalization plus present information and communication technologies are further reasons why knowledge is of that high importance to today's businesses. The means of communication as well as transportation have accelerated enormously over the last decades. In addition, the size of nowadays' companies is increasing, which requires more information and the better use of it.

The importance of knowledge and intangibles appears clearly in the change of the so-called "Market Value/Book Value Difference"¹³ – a general measurement for the goodwill of an enterprise – over time. As this difference comprises assets which are not declared in a company's balance sheet¹⁴, it can be seen as the value of its intellectual capital, which is synonymous to its intangible assets. Figure 1.1 delivers an example for this: the percentage of intangible assets – and therefore the goodwill – of the S&P 500¹⁵ heavily increased from 17 % in 1975 – over 32 % in 1985 and 68 % in 1995 – to 80 % in 2010. So the percentage the intangible assets now have of the total market value amounts to more or less the same as the tangible assets had only about 35 years earlier. This drastic shift of the composition

⁹Stew97, Foreword xiii.

¹⁰Stew03, Foreword xii.

¹¹ShMc07, p. 276.

¹²German original, translated by the author; cf. Nort11, p. 14: "Der strukturelle Wandel von arbeits- und kapitalintensiven zu informations- und wissensintensiven Aktivitäten bedeutet, dass Unternehmen zunehmend Informationen, Wissen oder intelligente Produkte und Dienstleistungen verkaufen."

¹³The Market Value/Book Value Difference is explained in section 5.1.1.1 of this thesis.

¹⁴Among other things, a balance sheet includes the tangible assets, the liabilities and the equity of a company.

¹⁵The S&P 500 is a stock market index maintained by Standard & Poor's, which is a US American financial services company. It includes the data of 500 so-called "leading" US companies. Cf. S&P12.

concerning the market value is often even more remarkable in intangible assets-oriented, frequently service-oriented, firms (e.g. software developers, consultancies and pharmaceutical companies).

An overview of the change of the value of intangibles of the various business sectors over

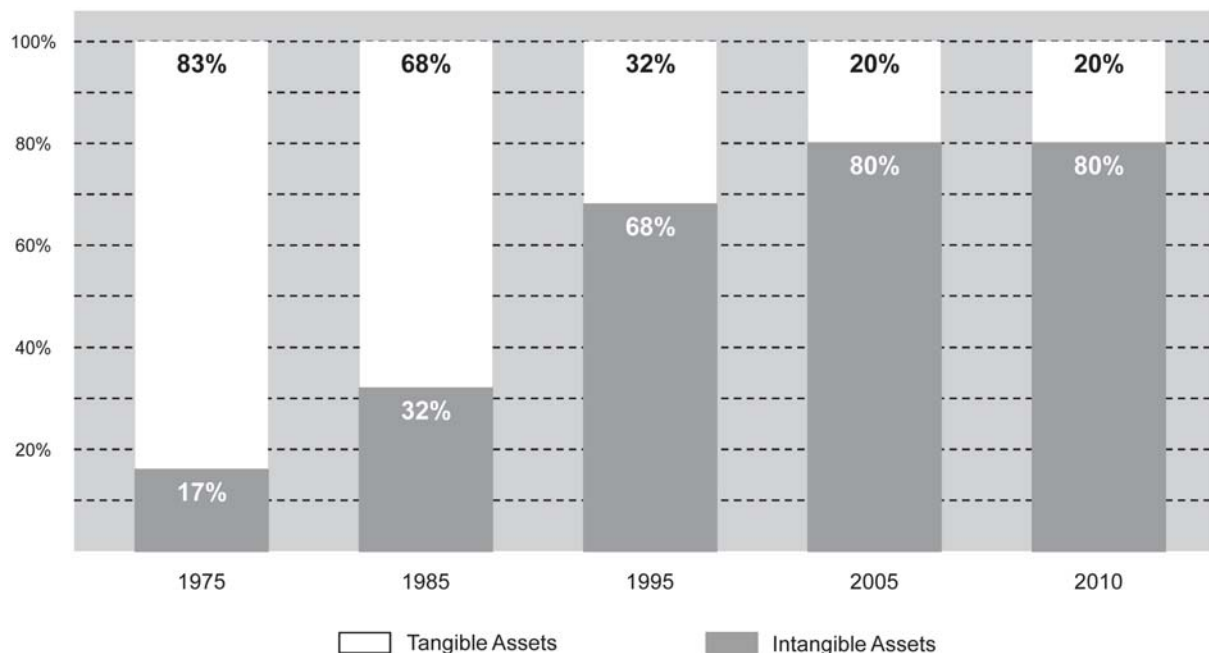


Figure 1.1: Components of S&P Market Value¹⁶

time gives Figure 1.2. It shows the development of the S&P 500 from 1975 to 2005. This diagram again clearly illustrates the significance of intellectual capital today in comparison to some decades earlier. In 1975, only the sectors "Health Care", "Information Technology" and "Consumer Staples" showed high percentages regarding the intangibles' share of total market capitalization, more precisely numbers of over 50 per cent. The share of intangible assets in the other mentioned branches of industry only amounted to about 10 per cent or less. The figures of 2005 furthermore prove that intangible assets have by now become crucial in every business sector, headed by "Consumer Staples", "Health Care", "Consumer Discretionary" and "Industrials".

But knowledge management is not only crucial for gaining (higher) profits with the (better) use of information, it is also an important factor in (efficient) "capital spending for knowledge", e.g. for hard- and software, research and development, or staff training. In many of today's thriving businesses the percentage of money invested in knowledge does often exceed the amount used for other expenses, for example equipment or rents. In this context,

¹⁶Cf. OcTo11.

¹⁷Adapted from CaBa06, pp. 18-19.

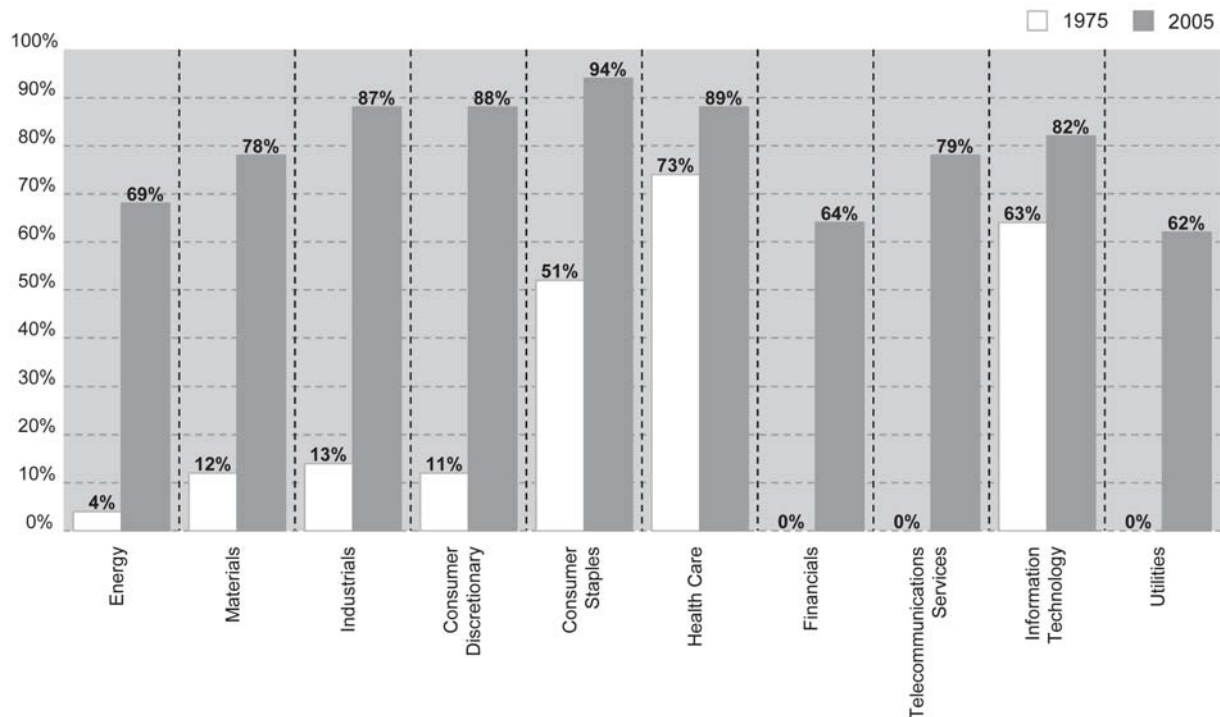


Figure 1.2: Intangible value as a % of total market capitalisation by sector¹⁷

with the help of knowledge, a reduction in the quantity of physical goods and equipment held in a company is often achieved: for instance, a car manufacturer outsources their production of certain components after finding out – by way of research and computations which clearly involves information and knowledge – that their own expenses in manufacturing exceed the spending on purchasing the parts from an external supplier. Another example would be a manufacturing enterprise which gathers all incoming orders for their products over time, and can then use all the information therein to calculate what their customers will probably need of product X for month Y or day Z, and therefore keep their stockholding costs low. This practice is renowned as Efficient Customer Response, which has become a commonly applied best practice¹⁸ in the retail industry. Jürgen H. Daum¹⁹ – who is, amongst others, professional advisor in enterprise and performance management – states that information technology actually supports companies in many ways and situations in substituting tangible assets by intangible ones.²⁰

¹⁸Dieter Herbst, communication expert, explains best practice as "[...] those procedures, methods and modes of operation that exhibit a particular high productivity, quality and value creation. Best Practice presents the momentary best solution for a problem." German original, translated by the author; cf. Herb00, p. 107: "'Best Practice' sind jene Verfahren, Methoden und Arbeitsweisen, die eine besonders hohe Produktivität, Qualität und Wertschöpfung aufweisen. Die Best Practice stellen die derzeit beste Lösung für ein Problem dar."

¹⁹Cf. Daum02.

²⁰Other examples for information technologies which help in raising the speed and efficiency of business procedures and in reducing capital expenditures therein are, for instance, ERP (Enterprise Resource Plan-

Hence, managing knowledge and their intellectual assets is vital for every industry and business, and above all the fundamental reason for the importance of intellectual capital management, according to Thomas A. Stewart, is that today "[...] only by means of knowledge can companies differentiate their work from their competitor's. Other sources of competitive advantage are rapidly drying up: geography (weakened by electronic commerce [...], regulation (which once insulated enormous sectors [...], [...] vertical integration ([...] more and more companies are finding it cheaper to buy on the open market what they once made themselves)"²¹, "[...] access to capital, materials, markets [and] equipment [...]"²². University professors Alain Bernard and Serge Tickewitch share the same view and argue in the following way: "[t]he key of competitiveness is knowledge, because of the necessity of reactivity, flexibility, agility and innovation capacities."²³ In agreement to this, Samar Ammar-Khodja and Alain Bernard summarize: "Knowledge is regarded nowadays as a strategic resource and a factor of stability, bringing a decisive competing advantage. Knowledge Management (KM) is necessary to the company to innovate on products, processes, services and on the organization. It allows at the same time to reduce its design costs, production, distribution, etc."²⁴ University professor David P. Norton moreover argues that "[v]arious studies show that up to 85 percent of a corporation's value is based on intangible assets."²⁵ Andrew Mayo, Professor of Human Capital Management at the Human Resource Management Department at Middlesex University in London (United Kingdom) and head of his own consultancy, furthermore declares that "[t]he inescapable conclusion is that valuing and quantifying intellectual capital form perhaps the greatest challenge facing businesses today. Investors need methods of understanding how value is being created in the organization and assessing what confidence they can have in the future. Management needs measures in order to manage these assets more coherently and effectively. And accountants need ways of achieving a more complete asset valuation. We should expect more activity and attention to be given to managing intellectual capital than to managing tangible assets."²⁶

To formulate it in more monetary terms: investment decisions on intellectual capital are the

ning) systems, EDI (Electronic Data Interchange) facilities, SCM (Supply Chain Management) systems or CRM (Customer Relationship Management) technologies.

²¹Stew03, p. 18.

²²Stew03, p. 25.

²³BeTi08, p. v.

²⁴BeTi08, pp. 3-4.

²⁵BeHu01, p. ix.

²⁶Mayo03, p. 30.

most important ones today. With the impact of the global financial crisis, this has become even more essential, after years of recession, stagnancy, slow growth and again recession. Exactly therefore it is necessary for each manager to understand about their company assets, especially the intangible ones, and to be able to accurately choose on their arising investment opportunities. In this context, for Jürgen H. Daum²⁷ the business strategy on how a company aspires to create value out of their intellectual capital is especially relevant. Daum argued already in 2002 that this enhanced knowledge and use of intangible assets could lead to an economic growth as a whole, and could therefore be particularly of avail in times of economic troubles and challenges, and so also now.

Furthermore, these days a business formation is even harder to achieve than a decade before. Also in this context, intellectual capital is of high relevance and can support the founder in attracting investors by attaching an intellectual capital report to the business plan.

One part of the intellectual capital and one central source of knowledge are certainly a company's employees. Although staff cannot be owned by the enterprise, it has to be taken into account as an intangible asset to allow a broad measuring and reporting on intellectual capital. The value of employees for a company is hard to measure with traditional (accounting) methods, what intellectual property and valuation expert Jeffrey A. Cohen confirms when writing "[i]n general, it is more difficult to identify and measure human capital than intangibles such as patents, copyrights, or trademarks."²⁸ David P. Norton states the following concerning human capital: "[...] The asset that is most important is the least understood [...]."²⁹ Wilhelm Schmeisser, Professor for Business Administration at the University of Applied Sciences Berlin, and Martina Lukowsky even argue that "[i]n most reporting and controlling systems human capital [so also intellectual capital as the HC is part of the IC] appears only as a cost factor."³⁰ In their opinion "[t]he success factor human capital [and it is assumed intellectual capital as a whole] should be measureable and comparable to form a basis of internal and external decisions."³¹

The eminent importance of corporate compliance and compliance management (CM)³² as well as intellectual capital management and reporting is clear. To give an instruction on

²⁷Cf. Daum02.

²⁸Coh05, p. 71.

²⁹BeHu01, p. ix.

³⁰ScLu06, p. 1.

³¹ScLu06, p. 1.

³²Definitions of and the differentiation between compliance and corporate compliance are to be found in sections 2.2.1 and 2.2.2 of this thesis.

how to jointly implement the two disciplines in a company now is the challenge and purpose of this thesis.

As Thomas A. Stewart strikingly formulated already in 2003: "Risk management – usually a function of the treasury department – is a superb instance where a knowledge perspective can add value. Treasurers and CFOs know a lot about [...] risks [...]; but the field of intellectual risk management basically doesn't exist – and needs to, since intellectual risk is the real threat twenty-first-century companies face. [...] [R]isk management is dealing with visible classes of risk while greater, unmanaged dangers accumulate in the dark."³³ Up to now "[...] risk management [has been embedded] in a corner of the finance department. Managing intellectual risks ought to be a core activity of a knowledge company [...]."³⁴ "Just as intellectual assets have come to dominate tangible assets, so risks to intellectual assets and processes now dwarf traditional sources of risk."³⁵

So to succeed in the knowledge economy the way of how to manage a company and evaluate its knowledge assets is essential (as well as the business strategy itself). It does have to change considerably in contrast to traditional approaches, and this has to be done in connection with compliance management. How knowledge management is carried out heavily depends on the knowledge assets of an enterprise and their value, which can be determined by generating and using an intellectual capital report. For preparing and understanding such an account new vocabulary is needed.

³³Stew03, pp. 224-225.

³⁴Stew03, p. 225.

³⁵Stew03, p. 226.

Chapter 2

Disambiguation of Important Terms

A disambiguation at this point seems necessary, not only because new terms were introduced and are in wide use by now, they are often not as clearly explicable as one might perhaps wish. The terms explained in this chapter are the basis of all books, papers and theses on knowledge management, intellectual capital reporting and/or compliance management. Alistair Mutch, Professor of Information and Learning at the Nottingham Trent University (United Kingdom), really hit the mark when writing that "[...] aspects of data, information and knowledge lie at the heart of the use of power in organizations. They are not only shaped by that power but also contribute to its maintenance."³⁶

So to allow for an extensive understanding of the subsequent chapters, definitions and explanations of the most important and most prevalent terms are given in the following. The definitions and explanations here shall give a good overview of and an introduction to each of the terms; they are not meant to be concluding or the only ones valid.

2.1 Intellectual Capital Management and Reporting

While there are other quite important terms explained in the following, the most vital differentiation seems to be the one between data, information and knowledge. This is the case because clear distinctions are not often so easy to be made as various experts in the field of knowledge management and intellectual capital reporting give diverse definitions and explanations of the terms. What most of these authors do have in common, though, is that they argue for a differentiation of the three.

³⁶Mutc08, p. 200.

2.1.1 The Knowledge Staircase

The following disambiguation begins with introducing the so-called "knowledge staircase". It gives a very good overview of the genesis of knowledge. This concept was developed by University Professor of International Business Management at Wiesbaden Business School (Germany) Klaus North³⁷ and shows all the stages from solely having symbols, over data, and information, to creating knowledge, which is followed by action, enhanced by competence, which then finally leads to competitiveness. Figure 2.1 depicts this stairwell.

Don Tapscott, a Canadian consultant and Professor of Management at the Joseph L. Rot-

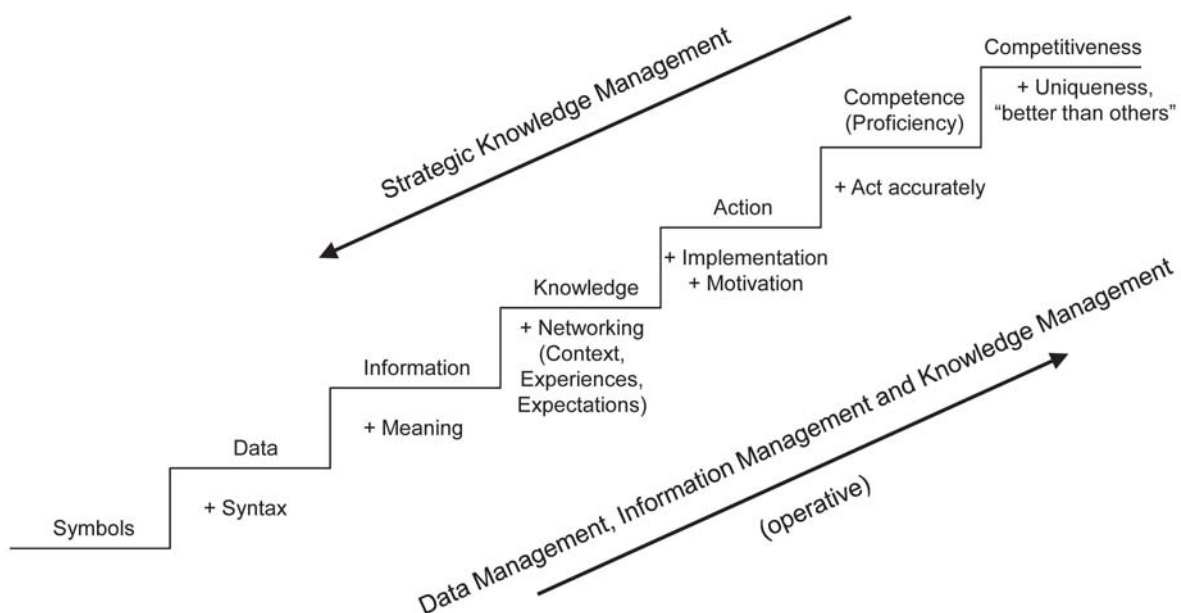


Figure 2.1: Knowledge Staircase³⁸

man School of Management at the University of Toronto (Canada), explains how the transfer from data over information to knowledge takes place: "Raw data are indeed disorganized, empirical facts. When organized and defined in some intelligible fashion, then data becomes information. Information that has been interpreted and synthesized, reflecting certain implicit values, becomes knowledge. And knowledge that carries profound, transhistorical insights might become wisdom."³⁹

Those terms of the knowledge staircase which are in extensive use in knowledge and intellectual capital management are explained on the next pages.

³⁷Cf. Nort11.

³⁸Adapted from Nort11, p. 36.

³⁹Taps98, p. 32.

2.1.2 Data

Leif Edvinsson, who besides other functions has been the first director of intellectual capital worldwide (at the Swedish insurance company Skandia then), and Gisela Brünig, a German management consultant especially in the field of knowledge management, explain "[d]ata [...] [as] context-independent available numbers and symbols."⁴⁰ Annie Brooking, founder of "Ideas to Market" and erstwhile CEO of several IT⁴¹ companies and visiting professor to Newcastle University (United Kingdom), says likewise that "[d]ata are facts, pictures, numbers – presented without a context."⁴² For professor of Human Resource Management and Business Psychology Rüdiger Reinhardt⁴³ data are also basically symbols, or a definable sequence of symbols.

According to the Oxford English Dictionary⁴⁴, "data" can either be understood as being a count or a mass noun. If it is used as a count noun, then it is defined as "[...] an item of information; a datum; a set of data.[...]". Otherwise, the following explanations for "data" are given: generally, data are "[...] Related items of (chiefly numerical) information considered collectively, typically obtained by scientific work and used for reference, analysis, or calculation. [...]" In the context of computing, data are "[...] Quantities, characters, or symbols on which operations are performed by a computer, considered collectively. Also (in non-technical contexts): information in digital form. [...]"⁴⁵

The Cambridge Business English Dictionary⁴⁶ provides another aspect of "data". It generally defines it as "information, especially facts or numbers, collected to be examined and considered and used to help with making decisions [...]". Its IT-related definition says that "data" is "information in an electronic form that can be stored and processed by a computer [...]"⁴⁷

In contrast to these views, Alistair Mutch argues that data are only important in the context we chose it: "Data are [...] sense impressions of the world shaped by our questioning of

⁴⁰German original, translated by the author; cf. EdBr00, p. 13: "Daten sind kontextunabhängig vorliegende Zahlen und Zeichen."

⁴¹IT stands for "Information Technology".

⁴²Broo99, p. 4.

⁴³Cf. Rein02.

⁴⁴The Oxford English Dictionary is an online dictionary provided and maintained by the "Oxford University Press", which is a department of the University of Oxford (UK). The website of the dictionary can be found under <http://www.oed.com/>.

⁴⁵OxED12a.

⁴⁶This dictionary is provided by the "Cambridge University Press" which is the university press of the University of Cambridge (United Kingdom) and is available at <http://dictionary.cambridge.org/dictionary/business-english/>.

⁴⁷CBED11a.

that world. What we chose to regard as important is conditioned by the questions that we start with. This places considerable importance on the nature of the questions that we ask, rather than on our capacity to collect data."⁴⁸ Besides, the communication expert Dieter Herbst⁴⁹ also mentions the term "ideas": he brings forward the argument that before data exist there are ideas; so for him data originate in ideas.

2.1.3 Information

Thomas A. Stewart defines information simply as "[...] a context into which the data can be put"⁵⁰, while Annie Brooking explains it accordingly as "[...] organized data presented in context."⁵¹ In their work, Edvinsson and Brünig argue more or less in the same fashion as Stewart and Brooking, writing that "[d]ata is packed to information by way of putting them in a reasonable context and reference to a [specific] purpose."⁵²

For the Cambridge Business English Dictionary furthermore "information" is "facts or details about a person, company, product, etc. [...]"⁵³. In addition to this, Karl-Erik Sveiby, long-time expert in the field of intellectual capital, sees "[t]he term 'information' [...] [as] generally connected to facts as well as the communication of facts."⁵⁴

The Oxford English Dictionary furthermore provides a variety of definitions for the term "information". Some of these are cited in the following: "information" in the context of "imparting of knowledge in general" can be, for instance, used as a count noun, which then means "[...] a teaching; an instruction; a piece of advice. [...]" The term may also be understood as "[...] Knowledge communicated concerning some particular fact, subject, or event; that of which one is apprised or told; intelligence, news. [...]" "[...] Contrasted with data: [information is then] that which is obtained by the processing of data.[...]"⁵⁵

Moreover, for Alistair Mutch information "[...] does not get depleted or worn out in use, like other assets. Rather, it can expand its value in use."⁵⁶ But "[...] information by itself implies nothing about the value which can be realized from it."⁵⁷ Furthermore, for Mutch "[...] what

⁴⁸Mutc08, p. 45.

⁴⁹Cf. Herb00.

⁵⁰Stew97, p. 69.

⁵¹Broo99, p. 4.

⁵²German original, translated by the author; cf. EdBr00, p. 13: "Daten werden zu Informationen verdichtet, indem sie in einen sinnvollen Zusammenhang und Zweckbezug gebracht werden."

⁵³CBED11b.

⁵⁴German original, translated by the author; cf. Svei98, p. 69: "Das Wort 'Information' ist daher in der Regel sowohl mit Fakten als auch mit der Mitteilung von Fakten verbunden."

⁵⁵OxED12b.

⁵⁶Mutc08, p. 51.

⁵⁷Mutc08, p. 51.

is important is the viewing of information as both process and product, in which we are concerned about the relationship between the two."⁵⁸ He explains the former concept of information by saying that "[w]e might want to consider information as a process in two ways. One is the process of interpretation that we undergo when faced with any data – the way in which we assimilate them to our existing knowledge patterns, for example, or cross-refer them to other data to place them in context. A second is the organizational process that is engaged in, where often data are created in one place, processed in another, manipulated in a third and used in a fourth."⁵⁹ Examples for the second approach to information – information as being a product – would be a book or a manual, where information is brought to written language and can be read and used again and again.

2.1.4 Knowledge

"Knowledge is the cross linking of data and information in some context and always activity-oriented."⁶⁰, this is the clear and brief way Edvinsson and Brünig explain the term.

For Thomas A. Stewart, furthermore, knowledge is "[...] a conclusion drawn from the data and information"⁶¹. The definition Annie Brooking gives is similar, namely that "Knowledge is information in context, together with an understanding of how to use it."⁶²

Dieter Herbst, expert in the field of communication and Head of the Masters Degree Programme "Leadership in Digital Communication" at the Berlin University of the Arts, defines knowledge as "[...] the network of proficiency and skills, which somebody applies to solve a problem."⁶³ Therefore, for him "Knowledge is a process and not a status."⁶⁴ So Herbst, like Stewart, sees the origin of knowledge in information. Determinants in this process of transferring information to knowledge are the learning, the expertise, the socialization and the culture of respective person, which are displayed in Figure 2.2.

Additionally to the view of knowledge as a process, Samar Ammar-Khodja and Alain Bernard explain knowledge in this fashion: "Knowledge is a whole set of intuition, reasoning, insights, experiences related to customers, products, processes, markets, competition and

⁵⁸Mutc08, p. 52.

⁵⁹Mutc08, p. 51.

⁶⁰German original, translated by the author; cf. EdBr00, p. 13: "Wissen ist die Vernetzung von Daten und Informationen in einem Kontext und immer handlungsorientiert."

⁶¹Stew97, p. 69.

⁶²Broo99, p. 5.

⁶³German original, translated by the author; cf. Herb00, p. 9: "Wissen bezeichnet das Netz aus Kenntnissen, Fähigkeiten und Fertigkeiten, die jemand zum Lösen einer Aufgabe einsetzt."

⁶⁴German original, translated by the author; cf. Herb00, p. 9: "Wissen ist ein Prozess und kein Zustand."

⁶⁵Cf. Herb00, p. 10.

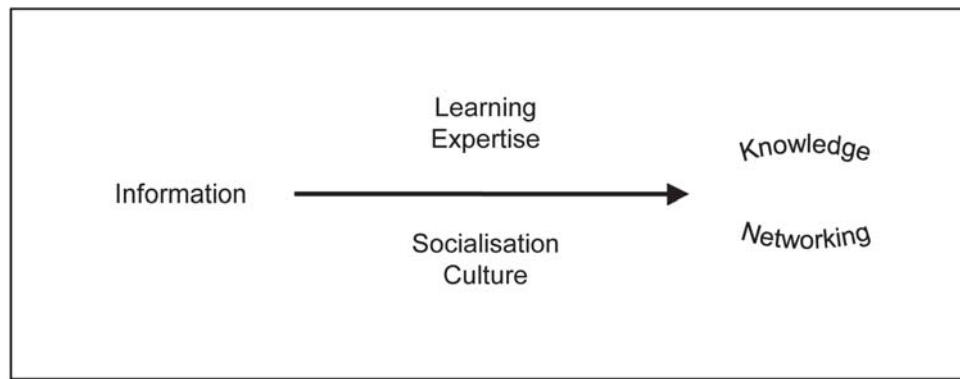


Figure 2.2: Evolution of Knowledge from Information⁶⁵

so on that enables effective action."⁶⁶ The definition the Cambridge Business English Dictionary provides is based on a similar but still different approach: there "knowledge" is the "skill in, understanding of, or information about something, which a person gets by experience or study [...]"⁶⁷.

Rüdiger Reinhardt⁶⁸ furthermore declares that knowledge as a resource has a multiple character, by which he means that the knowledge one person has can be (easily or more difficult) transferred to another person but stays with its previous owner still. For Reinhardt knowledge can be utilized and exerts influence in three ways: first, knowledge can be integrated in a product. By using knowledge this way companies are able to improve the quality of their offered services or the design of their manufactured products. Secondly, knowledge can be used in an object-related process, which means incorporating knowledge into business processes. This may help in inducing a refinement as well as more flexibility of these processes and the value-added process as a whole. Finally, knowledge can be applied in a self-referential process where knowledge is the basis for creating new knowledge. Prominent examples where this is done are, for instance, consultancies or law firms, but it can be applied in other companies as well.

Herbst⁶⁹ sees this feasible and promising for every enterprise, because circulating knowledge in such an entity allows for collecting the knowledge of each individual therein. Hence, new ways of problem solving can be found, and ideas as well as new knowledge established, which can then lead to a competitive advantage. How long this benefit can be held depends very often on changes on the market and in technologies. As well as the competitive advantage can diminish over time, so can the knowledge. This is shown in Figure

⁶⁶BeTi08, p. 5.

⁶⁷CBED11c.

⁶⁸Cf. Rein02.

⁶⁹Cf. Herb00.

2.3, which gives a general overview of the knowledge life cycle which comprises the stages of the setup, the development, the maturity, the reduction, and finally the deterioration of knowledge. To be up to date and able to adapt swiftly to shifts in conditions, possessed knowledge has to be updated and new knowledge created.

For Reinhardt⁷¹ both information and knowledge are intangible and exist only in the con-

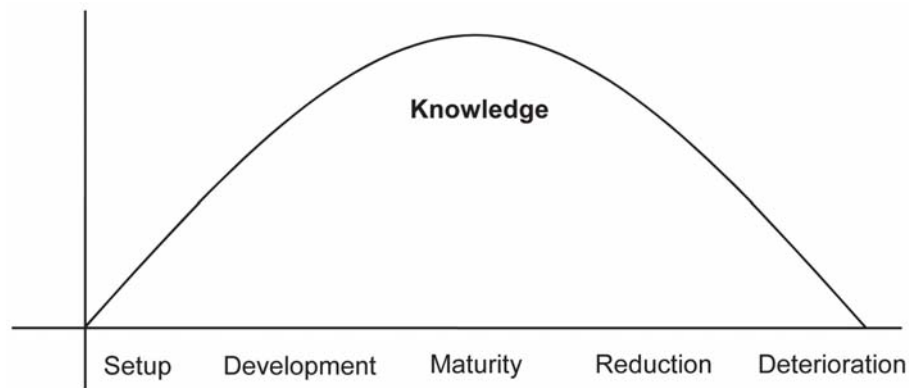


Figure 2.3: Knowledge life cycle⁷⁰

text of a so-called "carrier". To define whether a message – as he calls it – is information or knowledge depends on the person who receives it. It is information if the recipient did not know the content of the message before, and it is knowledge if they knew it already. Stewart is approving this when he writes that "[i]t is impossible [...] to make a clear distinction between information and knowledge that works for a very large group [...] [,] because one man's data can be another man's knowledge, and vice versa, depending on context."⁷² While for Reinhardt both information and knowledge are bound to the carrier, Herbst sees this only true regarding the latter. For him information is existent without the carrier as well. Furthermore, Stewart argues that "Knowledge involves expertise. Achieving it involves time. It endures longer than information – sometimes forever."⁷³ Additionally, Herbst reasons that "Knowledge receives value by applying it purposefully."⁷⁴

Alistair Mutch concludes that while traditionally information is defined as generated out of a set of data, and knowledge originated by the use of information, knowledge should be seen as the source of the other two. For him "[...] it is knowledge that suggests the data we need and the information that we will draw from it."⁷⁵ Moreover, for Mutch "[...] knowledge is an

⁷⁰Cf. Herb00, p. 13.

⁷¹Cf. Rein02.

⁷²Stew03, p. 6.

⁷³Stew03, p. 6.

⁷⁴German original, translated by the author; cf. Herb00, p. 11: "Wissen erhält Wert, indem es zweckorientiert eingesetzt wird."

⁷⁵Mutc08, p. 63.

implicit part of organizational functioning [...]".⁷⁶ So "[i]n terms of organizations, the most important focus in recent years has been that on tacit knowledge."⁷⁷

This statement leads to a necessary differentiation between explicit and tacit knowledge⁷⁸ which Mutch summarizes in this way: "[w]hile an area for debate, this refers to a distinction between formal bodies of knowledge, often taking the form of procedures in written form (explicit knowledge) and knowledge which is personal and gained through experience [tacit knowledge]. The debate centres on the extent to which tacit knowledge can be made explicit."⁷⁹

2.1.5 Explicit Knowledge, Tacit Knowledge & Implicit Knowledge

Research on the terms "explicit", "implicit" and "tacit knowledge" does often lead to the differentiation of explicit and implicit/tacit knowledge where implicit and tacit knowledge are wrongly treated synonymously.

2.1.5.1 Explicit Knowledge

Apart from the general distinction between explicit and tacit knowledge from above, the Cambridge Business English Dictionary gives this definition of what explicit knowledge is: it is "knowledge that can be expressed in words, numbers, and symbols and stored in books, computers, etc. [...]"⁸⁰. Mutch further describes it as "[...] knowledge which can be taken from its original context and represented in forms which can circulate widely around organizations."⁸¹ "So explicit knowledge is independent from its carrier [...]"⁸², Dieter Herbst states. Furthermore, "[...] it is formal knowledge that has been captured by the corporate memory"⁸³, as Ammar-Khodja and Bernard define it. For Thomas A. Stewart "[a]lmost all explicit knowledge belongs in the domain of structural capital"⁸⁴. Here are documents,

⁷⁶Mutc08, p. 130.

⁷⁷Mutc08, p. 56.

⁷⁸There exist other distinctions concerning knowledge, for instance core knowledge versus marginal knowledge, individual versus collective knowledge, internal versus external knowledge, or actual versus future knowledge. For explanations on these for example Herb00, pp. 13 ff. can be looked up.

The focus in this thesis is laid only on the differentiation between explicit and tacit knowledge as well as an explanation of what implicit knowledge is, as this is relevant for further analysis.

General overviews of some renowned types of knowledge moreover give KeNe09, pp. 12-13 or Hisl09, p. 81.

⁷⁹Mutc08, glossary.

⁸⁰CBED11d.

⁸¹Mutc08, pp. 14-15.

⁸²German original, translated by the author; cf. Herb00, p. 15: "Explizites Wissen ist also vom Wissensträger unabhängig [...]."

⁸³BeTi08, p. 9.

⁸⁴Structural capital is introduced in section 2.1.11 of this thesis.

databases, intellectual property, manuals, formulae, recipes, procedures, etc. [...]."⁸⁵ "The essential tasks [here] of managing explicit knowledge are the following: assemble it – validate it – as much as possible, standardize and simplify it – keep it up to date – leverage it – make sure everyone who needs it knows that it exists, where to get it, and how to use it – automate and accelerate the processes of retrieving and applying it – add to it – sue any bastard who steals it."⁸⁶

2.1.5.2 Tacit Knowledge

When comparing definitions and explanations of tacit knowledge with the ones for explicit knowledge, the former can be basically seen as the opposite of the latter.

Stewart sees "[...] tacit knowledge [...] [as] knowledge you have but do not express."⁸⁷ Furthermore, for Samar Ammar-Khodja and Alain Bernard "Tacit knowledge is personal knowledge that is difficult to formulate, measure or value [...]"⁸⁸ as "[i]t has an important cognitive⁸⁹ dimension [...]."⁹⁰ The Cambridge Business English Dictionary moreover sees tacit knowledge in relationship with human resources. There it says that tacit knowledge is "knowledge that you do not get from being taught, or from books, etc. but get from personal experience, for example when working in a particular organization [...]"⁹¹. Stewart additionally argues that "Tacit knowledge is – sometimes – explicable; more often, it's demonstrable"⁹² and that "[i]t's very much part of day-to-day work [...]."⁹³ For him, "[m]ost high-value knowledge is thick with tacit knowledge. Partly this is because so much explicit knowledge has been automated."⁹⁴ So "Tacit knowledge is mostly found in human and customer capital⁹⁵, in people and relationships [...]. Thus most of the stock of intellectual capital is tacit."⁹⁶

⁸⁵Stew03, p. 124.

⁸⁶Stew03, p. 124.

⁸⁷Stew03, p. 123.

⁸⁸BeTi08, p. 9.

⁸⁹Cognitive here means the employee's immanent human capabilities like beliefs, learning or creativity.

⁹⁰BeTi08, p. 9.

⁹¹CBED11e.

⁹²Stew03, p. 128.

⁹³Stew03, p. 128.

⁹⁴Stew03, p. 124.

⁹⁵Sections 2.1.10 to 2.1.12 of this thesis are concerned with explanations of human and customer capital as well as structural capital and a differentiation between the terms.

⁹⁶Stew03, p. 125.

2.1.5.3 The Relationship between Explicit & Tacit Knowledge

Concerning the relationship between explicit and tacit knowledge, Table 2.1 is borrowed. This was made up by Donald Hislop⁹⁷, Senior Lecturer in the Human Resource Management and Organisational Behaviour Group at Loughborough University (United Kingdom), and clearly shows the distinctions between tacit and explicit knowledge, enhanced by above named differences.

Tacit knowledge	Explicit knowledge
Inexpressible in a codifiable form	Codifiable
Subjective	Objective
Personal	Impersonal
Context specific	Context independent
Difficult to share	Easy to share
Carrier-dependent	Carrier-independent
Informal	Formal

Table 2.1: The characteristics of tacit and explicit knowledge⁹⁸

One last remark shall be made regarding tacit and explicit knowledge, related to the relationship between the two, namely the transfer of one into the other. The most prominent approach of transferring tacit into explicit knowledge was designed by Ikujiro Nonaka and Hirotaka Takeuchi. The Japanese scientists and university professors at Hitotsubashi University in Tokyo developed the meanwhile so-called SECI model – a 4 stage process which comprises the steps of Socialization (tacit to tacit knowledge), Externalisation (tacit to explicit), Combination/Creation (explicit to explicit) and Internalization (explicit to tacit) of knowledge.⁹⁹

2.1.5.4 Implicit Knowledge

Finally, of all the three definitions of explicit, tacit and implicit knowledge the most delicate explanation concerns the last one. This is the case because tacit knowledge is often incorrectly referred to as implicit knowledge, as already mentioned above.

Carl Frappaolo, who is an expert in knowledge, innovation and content management, writes the following concerning implicit knowledge and its relationship to explicit and tacit knowl-

⁹⁷Cf. Hislop9.

⁹⁸Extended from Hislop9, p. 23.

⁹⁹Cf. Nonaka, I. and Takeuchi, H.: *The Knowledge-Creating Company*, Oxford University Press, 1995, p. 72, Figure 3-4: Contents of knowledge created by the four modes.

edge: "A fundamental to knowledge management is the codification of knowledge into two basic forms: explicit knowledge (i.e. easily codified and shared asynchronously) and tacit knowledge (e.g. experiential, intuitive and communicated most effectively in face-to-face encounters.) There is, however, a middle ground. With dedicated and focused efforts, some knowledge believed to be tacit can be transformed into explicit knowledge. This body of knowledge is the organization's implicit knowledge."¹⁰⁰ "This is not to say that all tacit knowledge can be transfigured into implicit knowledge. There will always be bodies of know-how and experience that remain tacit. [...] The goal of implicit knowledge management is to determine how much of the tacit knowledge in your organization defies any form of codification, and to mine that which does not."¹⁰¹

2.1.6 Knowledge further enhanced

One further step of the knowledge staircase shall be shortly written about, namely competence. Communication expert Dieter Herbst¹⁰² argues that knowledge is not the end of the creation process which started for him with ideas and information. He explains that (by way of practicing it) knowledge leads to competence, as displayed in Figure 2.4.

Additionally to the knowledge staircase and above explained vocabulary, Alistair Mutch

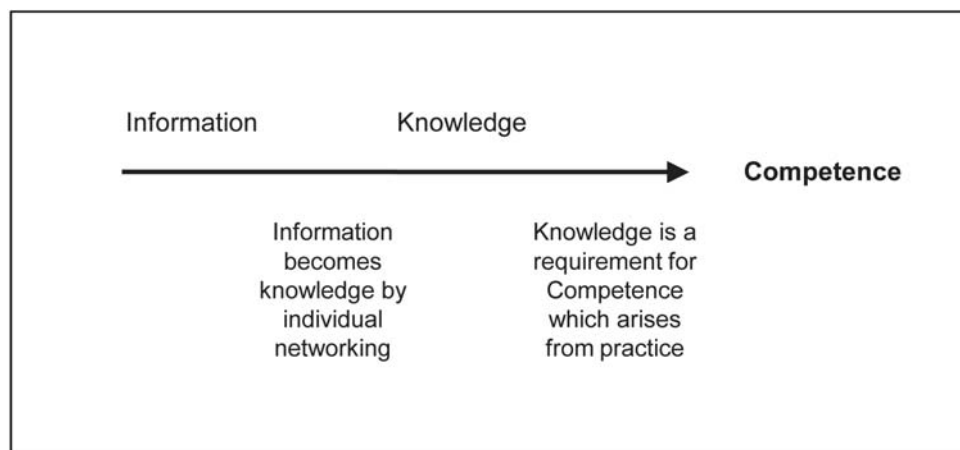


Figure 2.4: Evolution of Competence from Information¹⁰³

sees wisdom as necessary to introduce in the context of knowledge: he says that wisdom is needed to be able to appropriately apply knowledge.¹⁰⁴ In this context, Don Tapscott

¹⁰⁰Cf. Frap08, p. 23.

¹⁰¹Cf. Frap08, p. 24.

¹⁰²Cf. Herb00.

¹⁰³Adapted from Herb00, p. 11.

¹⁰⁴Cf. Mutc08, p. 41.

moreover explains that "[...] knowledge that carries profound, transhistorical insights might become wisdom."¹⁰⁵

2.1.7 Knowledge Management

So, after the meaning of those steps of the knowledge stairwell which are necessary to understand for this thesis has been elucidated, the concept knowledge management (KM) has to be further illustrated.

A quite simple explication of this term is given by Fons Wijnhoven, Associate Professor of Knowledge Management and Information Systems at the University of Twente, Enschede (The Netherlands): "[t]he handling of knowledge in specific contexts is often labelled knowledge management."¹⁰⁶ Another rather plain definition provides the Cambridge Business English Dictionary, namely that knowledge management is "the way in which knowledge is organized and used within a company, or the study of how to effectively organize and use it [...]"¹⁰⁷.

Dieter Herbst moreover describes knowledge management in the following way: "Knowledge Management is an active process, which centres the employees and establishes adequate framework requirements so that knowledge processes run continuously and target-oriented."¹⁰⁸ For Herbst, it is furthermore "[...] a complex strategic management concept with which a company forms its relevant knowledge holistically, goal- and future-oriented as a value increasing resource. The knowledge base of individual and collective knowledge is developed deliberate, active and systematic so that it contributes to the achievement of the company's objectives."¹⁰⁹ Moreover, "Knowledge management crosses all roles and hierarchy levels of an enterprise along the value-added chain."¹¹⁰

Herbst's definition of knowledge management which he published in the year 2000 is still true today if compared to the one given by Samar Ammar-Khodja and Alain Bernard in

¹⁰⁵Taps98, p. 32.

¹⁰⁶BeTi08, p. 23.

¹⁰⁷CBED11f.

¹⁰⁸German original, translated by the author; cf. Herb00, p. 27: "Wissensmanagement ist ein aktiver Prozess, der die Mitarbeiter in den Mittelpunkt stellt und geeignete Rahmenbedingungen schafft, damit Wissensprozesse kontinuierlich und zielgerichtet ablaufen."

¹⁰⁹German original, translated by the author; cf. Herb00, p. 23: "Wissensmanagement ist ein komplexes strategisches Führungskonzept, mit dem ein Unternehmen sein relevantes Wissen ganzheitlich, ziel- und zukunftsorientiert als wertsteigernde Ressource gestaltet. Die Wissensbasis aus individuellem und kollektivem Wissen wird bewusst, aktiv und systematisch entwickelt, sodass sie zum Erreichen der Firmenziele beiträgt."

¹¹⁰German original, translated by the author; cf. Herb00, p. 24: "Wissensmanagement durchzieht alle Funktionen und Hierarchiestufen eines Unternehmens entlang der Wertschöpfungskette."

2008: "Knowledge Management is a systematic, organized, explicit and deliberate ongoing process of creating, disseminating, applying, renewing and updating the knowledge for achieving organizational objectives. [...] [One important purpose of knowledge management in the company is] [t]reating the knowledge component of business activities as an explicit concern of business reflected in strategy, policy and practice at all levels of the organization [...]."¹¹¹ Besides this agreement with the characteristics of knowledge management Herbst identified, Ammar-Khodja and Bernard explain beyond that: "[...] Making a direct connection between an organization's intellectual assets – both explicit and tacit – and growth"¹¹² is crucial as well.¹¹³

Conclusively, the broad definition of the term "knowledge management" from Donald Hislop goes this way: "Knowledge management is an umbrella term which refers to any deliberate efforts to manage the knowledge of an organization's workforce, which can be achieved via a wide range of methods including directly, through the use of particular types of ICT¹¹⁴, or more indirectly through the management of social processes, the structuring of organizations in particular ways or via the use of particular culture and people management practices."¹¹⁵

In addition, Thomas A. Stewart cites the "Knowledge management imperative"¹¹⁶ which says: "Knowledge is your most important raw material. // Knowledge is your most important source of added value. // Knowledge is your most important output. // If you are not managing knowledge, you are not paying attention to business." Stewart also explains the tasks knowledge management comprises: "Knowledge-management activities are [...]: building databases, measuring intellectual capital, establishing corporate libraries, building intranets, sharing best practices, installing groupware, leading training programs, leading cultural change, fostering collaboration, creating virtual organizations [...]."¹¹⁷ For Stewart, knowledge management is important on several levels: "High-impact knowledge management comes from managing knowledge projects that create and improve returns on intellec-

¹¹¹BeTi08, p. 5.

¹¹²BeTi08, p. 5.

¹¹³This directly leads to the explanation of Intellectual Capital Management in section 2.1.8 of this thesis.

¹¹⁴ICT is the abbreviation of Information and Communications Technology for which Donald Hislop gives the following definition: "ICTs are technologies which allow/facilitate the management and/or sharing of knowledge and information. Thus the term covers an enormous diversity of heterogeneous technologies including computers, telephones, e-mail, databases, data-mining systems, search engines, the internet and video-conferencing equipment." Hisl09, p. 220.

¹¹⁵Hisl09, p. 59.

¹¹⁶Stew03, p. 109.

¹¹⁷Stew03, p. 117.

tual capital, supporting knowledge processes that add value to your company's work, and selling knowledge itself."¹¹⁸

Concluding, Dieter Herbst sees knowledge management as helpful and essential in practice in achieving the following benefits: "Cost-/time savings, process improvement, transparency over structures and processes, customer orientation and satisfaction, ease of decisions, improvement of information exchange, quality enhancement, successful market leadership, employee satisfaction and qualification."¹¹⁹

2.1.8 Intellectual Capital Management

Intellectual capital management (ICM) can be seen as a part of knowledge management or vice versa, sometimes the terms are also used synonymous, depending on the point of view. What clearly differentiates the two is that knowledge management focuses on the knowledge while intellectual capital management highlights the importance of the intellectual capital. If intellectual capital management is defined as part of the knowledge management, the latter is seen as the broader concept and the former as a narrower one. Reversed, knowledge is regarded as only one component of intellectual capital, so only one intangible asset.

By definition, intellectual capital management basically engages itself with managing the intangibles (of and in a company). Activities associated with this discipline focus on the intellectual capital which – for instance – "[...] needs to be formalized, captured, and leveraged to produce a higher-valued asset [...]"¹²⁰, Thomas A. Stewart notes. Intellectual capital management is for him "[...] a never-ending cycle: Identifying tacit knowledge; making it explicit so that it can be formalized, captured, and leveraged; encouraging the new knowledge to soak in and become tacit."¹²¹

According to Stewart intellectual capital management furthermore comprises these four steps: first, determining the importance knowledge has to your company and its business activities, and assessing its role (as input, as process, and as output) therein. Afterwards, a comparison between generated revenues and the intellectual assets which contributed to

¹¹⁸Stew03, p. 135.

¹¹⁹German original, translated by the author; cf. Herb00, p. 27: "Kosten-/ Zeitersparnis, Prozessverbesserung, Transparenz über Strukturen und Prozesse, Kundenorientierung und -zufriedenheit, Erleichterung von Entscheidungen, Verbesserung im Informationsaustausch, Qualitätssteigerung, erfolgreiche Marktführerschaft, Mitarbeiterzufriedenheit und -qualifizierung."

¹²⁰Stew97, p. 74.

¹²¹Stew97, p. 74.

them has to be done. Thirdly, deciding on a strategy on how to more efficiently use and exploit intellectual capital, for example by means of a restructuring. Finally, thinking about how knowledge work (of knowledge workers) itself could be improved.¹²²

The reasons why intellectual capital management is so important for every enterprise are summarized by university professors at the Harvard Business School Robert S. Kaplan and David P. Norton. They name the following benefits a company can obtain by exploiting intangible assets: "[...] to develop customer relationships that retain the loyalty of existing customers and enable new customer segments and market areas to be served effectively and efficiently; introduce innovative products and services desired by targeted customer segments; produce customized high-quality products and services at low cost and with short lead times; mobilize employee skills and motivation for continuous improvements in process capabilities, quality, and response times; and deploy information technology, data bases, and systems."¹²³

2.1.9 Intellectual Capital

For better understanding what intellectual capital management comprises the term "intellectual capital" (IC) has to be understood as well. "Intellectual capital" can basically be described as "the value of all the knowledge and ideas of the people in an organization, a society, etc. [...]"¹²⁴, the Cambridge Business English Dictionary says. The Oxford English Dictionary provides a similar explanation, namely that intellectual capital are "[...] the skills and knowledge possessed by an individual, organization, etc., regarded as a resource or asset. [...]"¹²⁵

Thomas A. Stewart furthermore gives various explanations and descriptions of it: "Intellectual capital is the sum of everything everybody in a company knows that gives it a competitive edge"¹²⁶ – in short: "Intellectual capital is packaged useful knowledge"¹²⁷ –, and to be more precise: "Intellectual capital is intellectual material – knowledge, information, intellectual property, experience – that can be put to use to create wealth."¹²⁸ Confirming this view, Joe Tidd, Professor for Science and Technology Research, Business and Management

¹²²Cf. Stew03, p. 77.

¹²³KaNo96, p. 3.

¹²⁴CBED11g.

¹²⁵OxED12c.

¹²⁶Stew97, Foreword ix.

¹²⁷Stew97, p. 67.

¹²⁸Stew97, Foreword x.

(SPRU) at the University of Sussex (Great Britain), cites that a UK (United Kingdom) national survey¹²⁹ identified the most crucial assets for a firm's prosperity as being intangible ones.¹³⁰ In this poll CEOs of UK companies were questioned concerning the most important factors contributing to business success. Therein places one to five were occupied by company reputation, product reputation, employee know-how, organisational culture, and personal networks.

Stewart also points out that "Wal-Mart, Microsoft, and Toyota didn't become great companies because they were richer than Sears, IBM, and General Motors [...]. They had intellectual capital."¹³¹ In Stewart's opinion it is not only important to have intellectual capital, "Knowledge assets [and therefore intellectual capital], like money or equipment, exist and are worth cultivating only in the context of strategy."¹³²

The terms "intangible assets"¹³³ or "intangibles" are often used interchangeably with "intellectual capital"¹³⁴, which Stewart already referred to in the year 1997 when he said that "[...] much intellectual capital is tacit [...]"¹³⁵ and then in 2003 that "[...] knowledge assets [of the company are something that is] [...] for our customers [...] both unique and valuable"¹³⁶. He also wrote that "[...] the intangible assets [of a firm] – the talents of its people, the efficacy of its management systems, the character of its relationships to its customers – that together are its intellectual capital"¹³⁷. Annie Brooking more or less confirms this view by saying that "Intellectual capital represents intangible assets which frequently do not appear on the balance sheet."¹³⁸ She furthermore declares that "'Intellectual Capital' is [often basically]

¹²⁹Tidd unfortunately does not name the year the survey took place, but regardless to this circumstance the outcome of the survey is still relevant today. This is true due to the fact that the poll illustrates the high significance of intellectual capital for every company.

¹³⁰Cf. Tidd06, p. 37.

¹³¹Stew97, Foreword ix.

¹³²Stew97, p. 70.

¹³³Thomas A. Stewart defines "[...] an asset [...] [as] something that transforms raw material into something more valuable". Stew03, p.11.

Jeffrey A. Cohen differentiates between tangible and intangible assets in the following way: "[a]ll firms have two kinds of assets: those we can touch and those we cannot. The kind that we can see, feel, taste, buy, sell, and so on are, of course, called tangible assets. Everything else is an intangible asset." Cohe05, pp. 9-10. For Stewart, tangible assets are the so-called balance-sheet items, like cash, land, buildings or equipment. Cf. Stew03, Foreword x. Cohen disagrees about this, because he clearly sees financial assets like cash as intangible assets, too.

Moreover, for Cohen "Tangible assets often have intangibles associated with them. [...] [A] car or airplane, for instance, is a virtual repository of patented technologies. The car or airplane will also carry brands, trademarks, and copyrights (e.g., on the owner's manuals)." Cohe05, p. 11.

¹³⁴The synonym "knowledge capital" is also utilised when referring to intellectual capital.

¹³⁵Stew97, p. 74.

¹³⁶Stew03, p. 66.

¹³⁷Stew97, p. 55.

¹³⁸Broo97, p. 364.

defined as the difference between book value of the company and the amount of money someone is prepared to pay for it [- so the premium which is spent for the firm on top of the book value]."¹³⁹ Which one of the terms "intangible assets", "intangibles" and "intellectual capital" is applied is more depending on the field it is used, e.g. accounting or management. Thomas Diefenbach, who is a German business consultant, introduces the term "intangible resources" which is for him an umbrella term for all the denominations of intellectual capital in the literature. "An intangible resource is everything of immaterial existence, which is used or potentially usable for whatever purpose, which is renewable after use, and which not only decreases, but can remain or increase in quantity and/or quality while being used."¹⁴⁰ he declares.¹⁴¹

Totally independent from the domain where intellectual capital is used, for Leif Edvinsson and Gisela Brünig the "equilibrium" – so the same value as well as the substitution among themselves – between the terms "knowledge capital, intellectual capital, intangible assets, non-financial assets, immaterial assets, hidden assets, invisible assets and Tobin's q"¹⁴²"¹⁴³ does always have to be valid.

Moreover, there are various classifications of intellectual capital; they can, for instance, simply be divided into "[...] 'hard' intangibles like patents and copyrights, information-age assets such as databases and software, and – most important of all – 'soft' assets such as skills, capabilities, expertise, cultures, loyalties, and so on."¹⁴⁴ In contrast to this classification, Andrew Mayo¹⁴⁵ groups intellectual capital into the two pillars of structural capital, which he furthermore breaks down into customer (external structural) capital and organizational (internal structural) capital, and human capital. Karl-Erik Sveiby¹⁴⁶ enhances this approach by splitting the first column into two, having now the three classes of competences of people, internal (the organization of the company, like patents et cetera) and external structure (e.g. brands, and relationships to customers and suppliers). This model of differentiation between the intangibles is quite similar to the most established one according these three

¹³⁹Broo97, p. 364.

¹⁴⁰Dief06, p. 409.

¹⁴¹Besides, for Diefenbach "[...] "resource" means anything that is or could be entirely or partly of some use for something else – whatever these "things" are and however the use and ends are defined and interpreted." Dief06, p. 409.

¹⁴²An insight into Tobin's q delivers section 5.1.1.3 of this thesis.

¹⁴³German original, translated by the author; cf. EdBr00, p. 21: "Wissenskapital = Intellektuelles Kapital = Intangible Vermögenswerte = Nicht-finanzielle Vermögenswerte = Immaterielle Vermögenswerte = Verborgene Vermögenswerte = Unsichtbare Vermögenswerte = Q-Verhältnis (James Tobin)."

¹⁴⁴Stew03, Foreword x.

¹⁴⁵Cf. Mayo03.

¹⁴⁶Cf. Svei98.

groups: human capital (representing Sveiby's competences of people), structural (or organizational) capital (which would be the internal structure), and customer (or relationship) capital (which stands for the external structure).¹⁴⁷ Classification along these lines facilitates the localization of intellectual capital and its measuring, but it is also important that all of the three interchange to create and enhance the intellectual capital of a company. Still another approach for classifying the intangibles is suggested by Thomas Diefenbach who groups his "intangible resources" into the six categories of "human capital", "social capital", "cultural capital", "statutory capital", "informational and legal capital" and "embedded capital". An overview of the types of resources that belong to each of the classes gives Table 2.2. Human capital, for instance, comprises here the experiences, skills, feelings of people as well as their personal health and personality. Social capital furthermore refers to all resources linked to relations, while cultural capital involves cultural traditions, corporate culture and social norms, among others. The fourth group "statutory capital" comprises all resources related to the social position of a person, and the rights and duties a position implicates. "Informational and legal capital" refers to data and information, explicit knowledge and intellectual property, besides others. Finally, embedded capital comprises immaterial infrastructure – i.e. hierarchies or controlling structures – as well as organizational knowledge and routines.

Category	Human capital	Social capital	Cultural capital	Statutory capital	Inform. and legal capital	Embedded capital
Types of resources	Tacit knowledge based on and comprising qualifications, experiences, skills and abilities Individual feelings and values, hopes and objectives Personal health, wellbeing and manpower Individual competence of assessing, deciding, acting and behaving Personality Formal qualifications and degrees (legally protected)	Personal/informal relations, social norms, feelings and traditions between people knowing each other Not contractually regulated aspects of formal relations, e.g. trust, commitment, engagement, expectations, obligations ("psychological contract") Social competence (ability for discourse, conflict and cooperation) Power and reputation based on personal characteristics Personally produced services (legally protected)	Language Cultural traditions and heritage, national trait Corporate culture, working climate, informal rules Social norms, values, rules Law (legally protected)	Role, social position Power, status and influence related to a position (definition, disposition, and decision power) Rights and duties related to a position	Data (symbols, signs), information Explicit knowledge Intellectual property (company's name and logo, trademarks, drawings, formulas, software programmes, copyrights, patents, licenses, quota, internet domains, portals) Contractually regulated aspects of formal relations between parties (rights and duties)	Immaterial infrastructure (hierarchies, government, planning, information, communication, coordination, administration, and controlling structures and processes, channels of procurement and distributions) Organisational knowledge and abilities embedded in technologies and models Routines Knowledge embodied in processed or produced goods ("artefacts")

Table 2.2: The types of resources belonging to the single classes of intangible resources¹⁴⁸

¹⁴⁷Of course, there exist other classifications; this thesis only names the most renowned ones.

¹⁴⁸Adapted from Dief06, p. 414, Table 1.

2.1.10 Human Capital

Basically, human capital (HC) is the knowledge and expertise, the skills and talents an employee contributes to their work for generating a benefit for their employer. A similar explanation is provided by the Cambridge Business English Dictionary: human capital are "employees, and all of the knowledge, skills, experience, etc. that they have, which makes them valuable to a company or economy [...]"¹⁴⁹. This definition is stated with reference to economics and human resources.

Thomas A. Stewart¹⁵⁰ more precisely defines the human capital of a company as the group of people who spend their competence to gain a high added value, ultimately a competitive edge, and who are therefore difficult to replace. So for an enterprise human capital is the source of its innovation. In this context, the Oxford English Dictionary introduces the significance of human capital as a company asset, namely that the HC is "[...] a labour force, or the skills it possesses, regarded as a resource or asset. [...]"¹⁵¹

For intellectual capital consultants Kay Alwert, Manfred Bornemann and Mart Kivikas "Human capital covers amongst other things the skills, abilities and motivation of employees. Human capital is 'owned' by employees who can take their knowledge home with them or on to their next employer. Human capital cannot be completely controlled by the organisation."¹⁵²

Moreover, human capital is also often considered as the most important of the three groups of intangible assets. As staff cannot be owned, Jürgen H. Daum¹⁵³ encourages companies to intensively strive to commit their employees to them, achieving this, for instance, by compensating them with stock options of their firm.

For Andrew Mayo "Human capital is what people take home with them, and [– in contrast –] structural capital is what they leave behind."¹⁵⁴ This differentiation directly leads us to a more detailed explanation of organizational capital.

¹⁴⁹CBED11h.

¹⁵⁰Cf. Stew97.

¹⁵¹OxED12d.

¹⁵²AlBo04, p. 43.

¹⁵³Cf. Daum02.

¹⁵⁴Mayo03, p. 31.

2.1.11 Structural Capital / Organizational Capital

Human capital alone is elusive for any company; this business needs the shared knowledge and expertise of its staff. Therefore, the human capital has to be transferred into something more tangible to be (re-)used and enhanced: structural capital (SC), which is also named organizational capital (OC).

The term "organizational capital" can also be viewed and explained from a different point of view. Then "Structural capital covers all those structures and processes which the employees need in order to be productive and innovative overall. It consists of all those intelligent structures which remain when the employees leave the organisation after work."¹⁵⁵ This definition is given by Kay Alwert, Manfred Bornemann and Mart Kivikas.

The Cambridge Business English Dictionary's explanation moreover refers to the term of "intellectual property", it says: structural capital is "the value of all of a company's or organization's intellectual property including software, patents, etc. [...]"¹⁵⁶

So, process models and descriptions of technologies, manuals for machines, publications, patents and brands belong to the structural capital, as well as general structures in an enterprise, its company culture, computer and administrative systems, and databases and networks. All this "written down-knowledge" is often gathered in a knowledge database and ensures that the expertise stays within the company – even detached from its employees – as organizational knowledge.

2.1.12 Customer Capital / Relationship Capital

The third group of intangibles left to explain now is the one of customer capital (CC). What this relationship capital (RC)¹⁵⁷ of a company comprises is obvious: the relationships with its clients and suppliers, and the value that lies therein.¹⁵⁸ It is the loyalty to the enterprise and their brand(s) of customers and distributors, and the reputation the company has among them.

These considerations are confirmed by Kay Alwert, Manfred Bornemann and Mart Kivikas who write that "Relational capital describes an organisation's relations with customers and suppliers, as well as with other partners and the public."¹⁵⁹

¹⁵⁵ AIBo04, p. 44.

¹⁵⁶ CBED11i.

¹⁵⁷ Besides customer capital, relationship capital is sometimes also called relational capital.

¹⁵⁸ Cf. CBED11j.

¹⁵⁹ AIBo04, p. 44.

With the help of the internet, the telephone or the fax, communication between suppliers and manufacturers, between manufacturers and retailers, and between retailers and buyers can happen swiftly. But this development does have significant secondary effects, for instance: as today there are various ways available for everyone to compare offers of different vendors, it has also become much more difficult for companies to retain their clients. Thomas A. Stewart early noticed that "[...] when information is power, power flows downstream toward the customer".¹⁶⁰

Similar to human capital, Jürgen H. Daum¹⁶¹ again argues that relationship capital cannot be completely possessed by an enterprise. Suppliers and business partners as well as customers are not under full control of the company's management but operate much more on their own will. Hence, all of them are also part owners of the relationship capital.

Table 2.3 gives an overview of possible measures for human, structural and customer capital which can be used for intellectual capital management and reporting.

Wilhelm Schmeisser and Martina Lukowsky¹⁶³ clearly state that these human, structural and relationship capital are part of the so-called "Company Value", which they define as the capital resources of the company to which also financial capital and physical capital belong, as shown in Figure 2.5. For them, human capital is the most important sector of intellectual capital, and – besides the "balance sheet items" – the crucial part constituting the company value.

2.1.13 Intellectual Capital Report / Intellectual Capital Statement

In addition to the information given above about knowledge management and intellectual capital management, an explanation of the term "intellectual capital report" is indicated.

A rather plain explanation of what an IC statement is give university professor Christian Nielsen and his academic Danish colleagues, namely that "[...] intellectual capital statements represent the types of voluntary corporate disclosures that companies to a rising degree are making."¹⁶⁵ Another quite basic definition of this term is stated by Kay Alwert, Manfred Bornemann and Mart Kivikas, namely that "[...] intellectual capital statements show

¹⁶⁰Stew97, p. 149.

¹⁶¹Cf. Daum02.

¹⁶²Cf. Stew03, p. 314.

¹⁶³Cf. ScLu06.

¹⁶⁴Cf. ScLu06, p. 11.

¹⁶⁵NiBu06, p. 224.

HUMAN CAPITAL	STRUCTURAL CAPITAL	CUSTOMER CAPITAL
Avg. years of service	Administrative	Market share
Avg. education level	expense/sales	Customer loyalty
% with advanced degrees	Knowledge reuse: hits on	Avg. duration of customer
Hiring cost	intranet sites, best	relationship
IT literacy	practices replicated, etc.	Customer satisfaction
Hours of training/employee	Quality measures: errors,	Ratio of sales contacts to
Employee satisfaction	rework, etc	sales closed
Avg. years of service	Administrative	Market share
Avg. education level	expense/sales	Customer loyalty
% with advanced degrees	Knowledge reuse: hits on	Avg. duration of customer
Hiring cost	intranet sites, best	relationship
IT literacy	practices replicated, etc.	Customer satisfaction
Hours of training/employee	Quality measures: errors,	Ratio of sales contacts to
Employee satisfaction	rework, etc	sales closed
Success of employee- suggestion programs	Productivity gain attributable to new equipment vs.	Gross margin
Employee turnover (separations)	new ideas	Age of receivables
Value-added/employee	IT investment	Growth of collaborative arrangements like
	Cycle and process times	electronic data
	Cycle and process times	interchange and
	Patents cited by others	automatic stock
	Inventory/sales	replenishment

Table 2.3: List of measures/indicators for Human, Structural and Consumer Capital¹⁶²

an organisation's intangible assets."¹⁶⁶ In addition, they explain that "[a]n intellectual capital statement basically shows the assets of an enterprise which are not directly accessible, but which are vital to future economic success."¹⁶⁷ Moreover, "[m]any current intellectual capital statements incorporate the intellectual capital in a value-added model which takes account of the strategy (knowledge strategy), the performance processes, the results and the impact achieved."¹⁶⁸ Finally, the authors recapitulate that "[a]n intellectual capital statement is an instrument to precisely assess and to develop the intellectual capital of an organisation. It shows how organisational goals are linked to the business processes, the intellectual capital and the business success of an organisation using indicators to visualize these ele-

¹⁶⁶ AIBo04, p. 11.

¹⁶⁷ AIBo04, pp. 7-8.

¹⁶⁸ AIBo04, p. 11.

HUMAN CAPITAL	STRUCTURAL CAPITAL	CUSTOMER CAPITAL
Various measures of innovation: sales from new products, gross margin from new products, R&D* intensity, R&D efficiency (profits from new products/R&D spending)		Customer acquisition cost
New colleague-to-colleague relationships spawned		

*R&D stands for "Research and Development".

Table 2.3 (continued)

ments."¹⁶⁹

Furthermore, an intellectual capital report is an instrument to show the connections between intellectual capital, business processes, goals and success of a company.¹⁷⁰ It is designed out of the evaluation of a company's intellectual capital and assets, and reports on them and their value for the enterprise. This assessment of a company's intellectual capital and assets is done in the IC measuring while the IC statement is the virtual or printed composition or document which displays the results deduced from the former. The intellectual capital statement is often attached to the annual report, but can also be used internally as part of a controlling process. In 1995 the Swedish financial services provider Skandia was the first to publish an intellectual capital report.¹⁷¹

For Jutta Rump and Gaby Wilms¹⁷², HR (Human Resources) consultants and Professors at the Technical College of Ludwigshafen (Germany), there are some convincing arguments for preparing and publishing an intellectual capital statement: the basic effect of having the knowledge assets of a company written down, named and assessed offers the possibility of clearly picturing these assets and their potential for innovation for the first time; the communication inside the company and with its stakeholders is improved by the release of such a report and all the data and information therein; potential investors can gain insight in the existing intangibles and the capital expenditures of the organization, giving

¹⁶⁹ AlBo04, p. 11.

¹⁷⁰ Cf. GeiB06.

¹⁷¹ Cf. EdBr00, KaNo96.

¹⁷² Cf. RuWi07.

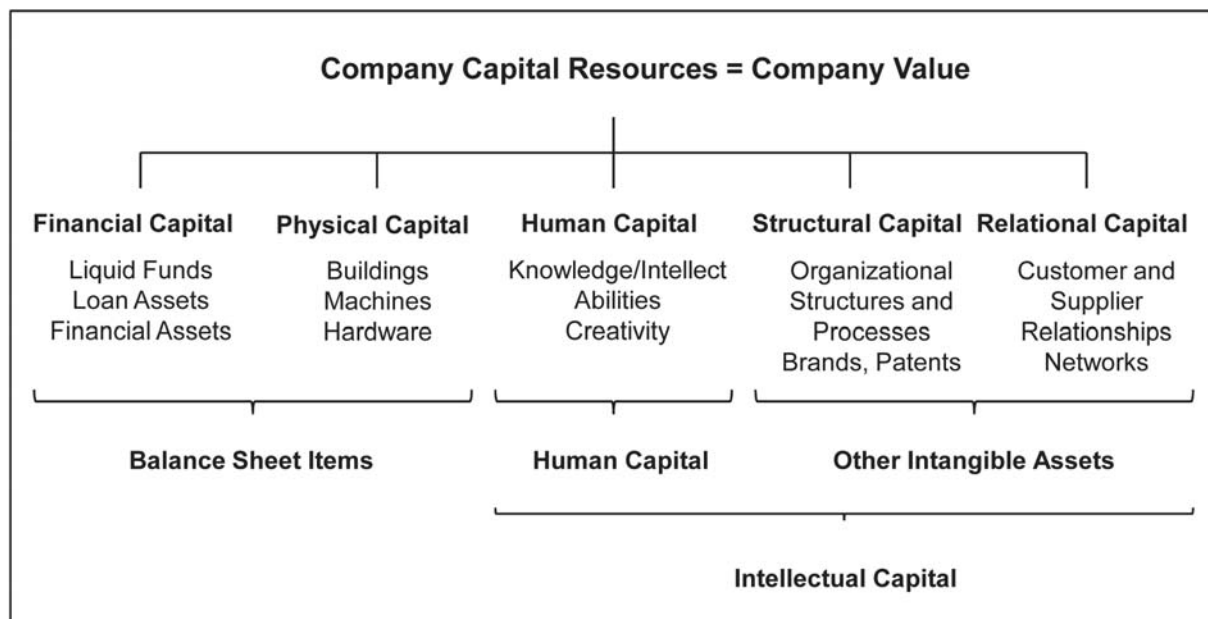


Figure 2.5: Human Capital as Component of the Company Value¹⁶⁴

them higher confidence and an incentive for further input; job applicants have the chance to become not only appealed by possible salaries but also by the knowledge environment of the firm; an intellectual capital statement retrospectively demonstrates the outcome of previously announced (aspired) achievements; and finally, legal requirements – for instance those imposed by BASEL III – are met this way.¹⁷³

2.2 Compliance Management

After illustrating some crucial terms concerning the intellectual capital management, the same is done in the following pages regarding compliance management. The terms and their definitions stated on the next pages will lead to a better understanding of the role that compliance and its management play in this thesis.

2.2.1 Compliance

The most crucial term to explain in this context seems to be "compliance". A short judicial description of this term is given by Christof Menzies, Head of the Expert Group concerning Governance, Risk and Compliance at the auditor PwC: compliance is the "[...] acting in compliance with applicable law" [...].¹⁷⁴ The definition provided by the Cambridge Busi-

¹⁷³Cf. RuWi07, p. 9.

¹⁷⁴German original, translated by the author; cf. Menz06, p. 2: "Aus juristischer Sicht ließe sich Compliance frei mit "Handeln in Übereinstimmung mit geltendem Recht" übersetzen."

ness English Dictionary says likewise that "compliance" is understood as "the fact of obeying a particular law or rule, or of acting according to an agreement [...]"¹⁷⁵ Wolfgang Becker, Head of the Chair of Business Administration at the Otto-Friedrich-University Bamberg (Germany), and Patrick Ulrich, scientific assistant at the same university, write similarly. They use this explanation for the term: compliance is the "[...] effective and efficient implementation of all policies and guidelines which are legally mandatory."¹⁷⁶

Jonathan Edwards, Head of the Sustainable Development Research Group at The Business School at Bournemouth University (United Kingdom), and Simon Wolfe, Reader in Banking and Finance at the School of Management at the University of Southampton (United Kingdom), define the term compliance likewise: "Compliance in general terms is the adherence by the regulated to rules and regulations laid down by those in authority. [...] The term compliance includes concepts of obedience, observance, deference, governability, amenability, passiveness, non-resistance and submission. Linked to this are aspects of duty that include doing what ought to be done, moral obligation, accountability, propriety, fitness, to be on one's good behaviour, answerability, acting morally and ethically."¹⁷⁷

Alexander Petsche, who is an Austrian lawyer and consultant on compliance systems, enhances the definition of compliance further. He says that "[t]oday compliance describes the fulfilment or conformance with governmental restrictions, regulations and specifications as well as with ethic and moral principles but also with standards and directives [...]. On the one hand, compliance can be based on constraint, such as in the case of statutory guidelines, on the other hand on the facultative adherence to standards and other regulations."¹⁷⁸ In addition, compliance management is roughly the management of the compliance an organization has to obey to.

2.2.2 Corporate Compliance

In addition to compliance, another important term to understand is "corporate compliance". For Christof Menzies and Kurt Glasner, Head of the Performance Improvement Department

¹⁷⁵CBED11k.

¹⁷⁶German original, translated by the author; cf. KeNe10, p. 7: "Compliance: effektive und effiziente Erfüllung sämtlicher juristisch verbindlicher Richtlinien und Vorgaben."

¹⁷⁷EdWo05, p. 48.

¹⁷⁸German original, translated by the author; cf. PeMa11, pp. 1-2: "Heute umschreibt Compliance die Erfüllung bzw Konformität mit staatlichen Restriktionen, Regeln und Spezifikationen sowie mit ethischen und moralischen Grundsätzen, aber auch mit Standards und Richtlinien [...]. Compliance kann zum einen auf Zwang, wie beispielsweise im Falle von gesetzlichen Vorgaben, und zum anderen auf fakultativem Einhalten von Standards und anderen Bestimmungen beruhen."

at PwC, the difference between compliance and corporate compliance is that the former focuses on single requirements while the latter does this on top enterprise level.¹⁷⁹ So, corporate compliance could also be seen as a part of compliance. Menzies furthermore explains that "[t]he term Corporate Compliance amplifies the above explained term compliance by a company-wide, integrative approach for fulfilling vital stakeholders' requirements effectively and efficiently."¹⁸⁰

Moreover, Menzies sees corporate compliance as the "[...] prerequisite for corporate governance that is sustained, risk- and value-oriented, ethical and compliant to rules."¹⁸¹ This directly leads to the next term of interest, namely corporate governance.

2.2.3 Corporate Governance

A rather plain definition of the term "corporate governance" is given by the Cambridge Business English Dictionary, where it says that corporate governance is "the way in which a company is managed by the people who are working at the highest level in it [...]"¹⁸².

Alexander Petsche moreover explains corporate governance as "the business's constitution".¹⁸³ For him, "[t]he difference between corporate governance and compliance is based on the point of view. While corporate governance characterizes the view of the regulators, compliance describes the perspective of the regulated, thus of the affected companies."¹⁸⁴ Concerning the relationship with and/or distinction to compliance it can additionally be pointed out another fact: as corporate compliance is part of compliance, corporate compliance is also part of corporate governance. To allow an extensive business management, corporate compliance has to be incorporated into corporate governance.

¹⁷⁹Cf. Menz06, p. IXX.

¹⁸⁰German original, translated by the author; cf. Menz06, p. IXX: "Die Bezeichnung Corporate Compliance erweitert den oben beschriebenen Compliance-Begriff um einen unternehmensweiten, integrativen Ansatz zur effektiven und effizienten Erfüllung der wesentlichen Stakeholder-Anforderungen."

¹⁸¹German original, translated by the author; cf. Menz06, p. 2: "Corporate Compliance wird hierdurch zu einer Voraussetzung für eine nachhaltige, risiko- und wertorientierte, ethische und regelkonforme Unternehmensführung."

¹⁸²CBED111.

¹⁸³Cf. PeMa11, p. 6.

¹⁸⁴German original, translated by the author; cf. PeMa11, p. 6: "Der Unterschied zwischen Corporate Governance und Compliance liegt in der Betrachtungsperspektive. Während Corporate Governance die Sichtweise der "Regulierer" prägt, umschreibt die Compliance den Blickwinkel der "Regulierten", also der betroffenen Unternehmen."

2.2.4 Risk

The Oxford English Dictionary mainly gives four meanings of the term "risk": "[...] 1. (Exposure to) the possibility of loss, injury, or other adverse or unwelcome circumstance; a chance or situation involving such a possibility. [...] 2. a. [...] (Exposure to) the possibility of harm or damage causing financial loss, against which property or an individual may be insured. Also: the possibility of financial loss or failure as a quantifiable factor in evaluating the potential profit in a commercial enterprise or investment. [...] b. The error [...] of an observation or result considered without regard to sign; the probability of an error; the mean weighted loss incurred by a decision taken or estimate made in the face of uncertainty; [...] 3. A hazardous journey, undertaking, or course of action; a venture. [...] 4. [...] a. A person or thing regarded as likely to produce a good or bad outcome in a particular respect. [...] b. A person or thing regarded as a threat or source of danger. [...]"¹⁸⁵ The Cambridge Business English Dictionary moreover provides some further definitions of the term "risk": a risk can either be "the possibility that something bad or dangerous will happen [...]" or might rather be understood as "something bad that might happen [...]". Furthermore, a risk might be perceived as "the possibility that an investment will lose money [...]" – which is a finance-related explanation of the term –, or – in the context of the subject of "insurance" – as "the possibility that something will be harmed, damaged, or lost [...]". Finally, a risk can be explicated as "a person or business that may or may not be safe to insure or lend money to [...]", which is a definition related to the insurance and banking industries.¹⁸⁶

2.2.5 Risk Management

Regarding the term "risk management" it is referred to Wolfgang Becker and Patrick Ulrich. They understand it as the "[...] structured process of the uniform and anticipative handling of risks and chances".¹⁸⁷ Moreover, the Cambridge Business English Dictionary names two definitions: the first one is that risk management is "the activity of calculating and reducing risk, so that an organization does not fail or lose money [...]", which is stated with reference to management and insurance. The second explanation is given in the context of finance and goes this way: risk management is "the activity of calculating and reducing risk in a set

¹⁸⁵OxED12e.

¹⁸⁶CBED11m.

¹⁸⁷German original, translated by the author; cf. KeNe10, p. 7: "Risk Management: strukturierter Prozess des einheitlichen und antizipativen Umgangs mit Risiken und Chancen, [...]"

of investments, so that investors do not lose money [...]"¹⁸⁸ Additionally, the Oxford English Dictionary defines in this way: risk management is [...] the forecasting and evaluation of risks in business and commerce, combined with the identification of procedures to avoid or minimize the impact of such risks. [...]"¹⁸⁹

Now the most important terms constituting intellectual capital and compliance management have been explained. Furthermore, relevant concepts on these two disciplines have been introduced as well, for instance the knowledge staircase or the classification of intellectual capital into the three pillars of human, structural and organizational capital.

¹⁸⁸CBED11n.

¹⁸⁹OxED12e.

Chapter 3

Explanation of this Thesis' Approach

After a disambiguation of the essential terms relating to intellectual capital measuring and reporting as well as compliance management, the approach of this thesis is going to be explicated below. Prior to that the motivation for this thesis' topic, and afterwards the target group for which the outcome of this thesis is meant for are illustrated. This order was chosen for the purpose of enabling an improved understanding of the following explanations.

3.1 Motivation for This Thesis' Topic

A detailed introduction to the various reasons for choosing the topic of this thesis is already given in the introductory part to this paper. These are associated with the subjects of intellectual capital reporting, compliance, compliance related to risk, intellectual capital in reference to risk, intellectual capital reporting on the basis of compliance, and small and medium-sized enterprises. Now, these main reasons are highlighted and cited again in short, and elaborated where necessary.

3.1.1 Intellectual Capital Reporting

One domain the thesis focuses on is the intellectual capital reporting. There exist a number of reasons for having decided on working on intellectual capital reporting. The most important points are the following:

- Companies have expanded in size over the last decades, a fact that makes better usage of knowledge inalienable to sustain the managing of the organization.
- Intellectual capital has become an asset of huge value for each company.

- Intangible assets meanwhile often replace tangible ones.
- Due to the increased importance of knowledge and intellectual capital, in many cases companies can almost only or only achieve a competitive advantage due to knowledge reasons.
- Intellectual capital management and reporting help to pointing out a firm's intangible assets.
- Intellectual capital management and reporting allows for managing the intellectual capital of an organization.
- Intellectual capital reporting improves the business' image towards stakeholders.
- Intellectual capital managing and reporting is a support for the business in reducing their expenses.
- Intellectual capital managing and reporting assists in deciding on remunerative investment decisions.
- The measuring and reporting of intellectual capital poses a big challenge to all businesses as intangible assets are difficult to detect, to assess and to manage.

3.1.2 Compliance

The decision to regard compliance is based upon these factors:

- Over the last years there has been a high quantity of financial and corporate scandals throughout the world.
- The world has still to struggle with the huge global financial crisis from 2007.
- Already implemented regulations, laws and standards for compliance are further developed, and new ones are established consistently.

3.1.3 Compliance & Risk

The reason for introducing risk and risk management in this chapter is derived from the following idea, written down by Terence Sheppey and Ross McGill: "It is recognized that the notions of compliance and risk overlap. The ongoing nature of the compliance process is

in the continual monitoring of processes and activities because of the risks they pose to the organization through non-compliance. [...] [Compliance's] activities are often governed by risk assessments, however formal or informal. Compliance is often measured against the risk profile of the organization, and these requirements are frequently assessed as threats, and then subject to processes that identify vulnerabilities and remedial action."¹⁹⁰

Furthermore, non-compliance to in-place imposed risks represents an external risk to organizations.¹⁹¹ Beyond that, "[t]he business [itself] is at risk from non-compliance [...]" as well as "[...] the key players [...]".¹⁹² Other risks concerning compliance comprise the executives' fear of lawsuits if published information or numbers turn out to be unreliable. Additionally, there is the concern of disclosing documents that might reveal confidential matters about the business.

The German lawyer and consultant Harald Plamper moreover realizes a connection not only between compliance and risk management but also to corporate governance. He is of the opinion that all these three disciplines influence each other.¹⁹³

3.1.4 Intellectual Capital & Risk

Besides the connection of risk with compliance, there also exists the one with intellectual capital. Due to Terence Sheppey and Ross McGill, "[...] the deliberate sharing of information exposes enterprises to the risk of intellectual property (IP) loss."¹⁹⁴ Günter Müller furthermore argues that companies are nowadays much more exposed to the risk of falling prey to industrial espionage. For him, this is the case due to several reasons: the intrinsic nature of the human being, the narrowness of mathematics and informatics as well as software products, and the existing higher transparency.¹⁹⁵

3.1.5 Intellectual Capital Reporting on the Basis of Compliance

Now, the factors for elaborating a control system for intellectual capital measuring and reporting in conjunction with compliance have been illustrated. On the one hand, all of today's businesses have to comply to some regulations, neither depending on economic sector nor country(-ies) they operate in. Single differences for organizations lie in the facts of "to which

¹⁹⁰ShMc07, pp. 154-155.

¹⁹¹Cf. ShMc07, p. 253.

¹⁹²ShMc07, p. 256.

¹⁹³Cf. KeNe10, p. 125.

¹⁹⁴ShMc07, p. 271.

¹⁹⁵Cf. Müll07.

law" and "to what degree" they have to obey. On the other hand, as explicated above, knowledge and intangible assets have to be managed these days to conduct business efficiently and effectively. This intellectual capital management and reporting again has to be implemented following certain requirements, more economically and logically reasonable, and less statutorily.

One consequence now is to join compliance management and intellectual capital reporting to get a comprehensive tool for implementing both: the compliance to obligatory regulations as well as the management and reporting of the companies' intangible assets. The appearance and implementation of the intellectual capital management and reporting depends on the laws that apply to the specific type of organization, while the standards of compliance are incorporated into the intellectual capital management and reporting. The use of the resulting combined rules system then allows to benefit from the in-place intellectual capital management and reporting and to be compliant simultaneously.

Another connection between compliance and intellectual capital is made by Terence Sheppey and Ross McGill. They describe it in this manner: "When the Sarbanes-Oxley Act [as well as other regulations] talks of documents, records, and reports, it is really referencing the information that is placed in the public domain to enable investors to make decisions. The assumption is that the better the quality of information, the more able the investor is to make a truly informed decision."¹⁹⁶

An additional relationship of intellectual capital reporting and compliance is illustrated by Günter R. Koch. He is former CEO of Austrian Research Centers (ARC)¹⁹⁷ Seibersdorf and member of the "High Level Expert Group on Intellectual Capital Reporting" of the European Commission. Koch argues that for obtaining an overall view on business and for being able to manage it comprehensively, intellectual capital reporting is vital. Other important components for this are corporate governance, risk management or regulations on compliance. Figure 3.1 visually displays this argument and names the other essential parts of Koch's approach.

¹⁹⁶ShMc07, p. 271.

¹⁹⁷In 2009, the ARC were renamed "Austrian Institute of Technology" (AIT).

¹⁹⁸Cf. KoHa05, s. 7: Wissensbilanzierung ist auch eine Methode zur (Wieder-) Gewinnung der Gesamtsicht (hier am Beispiel der Unternehmenswelt); German original, translated by the author.



*[*Note by the author: There already exists the improved version of BASEL II named BASEL III.]*

Figure 3.1: Intellectual Capital Reporting is also a method for the extraction/recovery of the overall view (here using the example of the world of business)¹⁹⁸

3.1.6 Small and Medium-sized Businesses

Finally, the reason for focusing the elaboration of the business rules¹⁹⁹ system on SMBs²⁰⁰ is explained. This is based on two circumstances: firstly, "[s]mall and medium-sized businesses have always played an important role in Germany [– which is likewise true for Austria –] because nearly half of the value creation of German's national economy is generated by small and medium-sized businesses."²⁰¹ To name numbers: in the EEA, the European Economic Area²⁰², there are about 20 million small and medium-sized businesses (including micro enterprises as well).²⁰³

Secondly, due to the extent of this thesis and its limitations as well as the fact that SMBs show other characteristics than multinational enterprises, the focus is given on the former solely.

¹⁹⁹More information on business rules and their use within this thesis is given in section 8 of this thesis.

²⁰⁰SMB is the abbreviation of "Small and Medium-sized Business". This kind of company is often also called SME which stands for "Small and Medium-sized Enterprise".

²⁰¹German original, translated by the author; cf. Schm10, p. 217: "Mittelständische Unternehmen spielen in Deutschland schon immer eine bedeutende Rolle, da knapp die Hälfte der Wertschöpfungen der deutschen Volkswirtschaft von mittelständischen Unternehmen erbracht wird."

²⁰²The EEA comprises all EU member states plus Iceland, Liechtenstein and Norway.

²⁰³Cf. CEC03b.

3.2 Approach of the Thesis

Subsequent to the illustration of the reasons for being concerned with this thesis' topic, its approach is going to be explained.

The aim of this thesis lies in finally having designed a control system which gives instructions and rules for implementing an intellectual capital measurement and reporting in an organization. More precisely, this is done for small and medium-sized enterprises in the context of and based on the regulatory compliance they have to follow.

Starting point of this thesis' approach are the best-known existing laws and regulations on compliance, which are scanned for relevancy for SMBs. Then those of importance are selected and analyzed to find the characteristics and factors which affect the intellectual capital management and reporting for small and medium-sized businesses.

Regarding the intellectual capital measuring and reporting, a similar track is followed: namely, looking at the most prominent examples of these and choosing the ones which are applicable to SMBs, considering the criteria and requirements previously found in the compliance analysis, as well as their chance on a successful implementation. The models for intangibles valuation are assessed – that is compared, parallels and differences worked out – to detect the vital criteria for a control system on intellectual capital measurement and reporting, as well as compliance. Finally, the control system is designed using business rules. This scheme can then be used for supporting the implementation in practice.

This approach for the thesis is displayed in Figure 3.2: the basis of this paper and its build-up is the question of "how to implement intellectual capital measuring and reporting based on compliance in SMBs?"; this is the core process²⁰⁴ which has to be elaborated. This process basically comprises rules²⁰⁵, data²⁰⁶ and information²⁰⁷, and technology²⁰⁸.

²⁰⁴According to the Cambridge Business English Dictionary a process is on the one hand "a series of actions that are needed in order to do something or achieve a result [...]" and on the other hand – and in the context of production – "a method of producing goods in a particular industry [...]". CBED11o.

²⁰⁵The following definition for the term "rule" is found in the Cambridge Business English Dictionary: a rule is "an accepted principle or instruction that states the way things are or should be done, and tells you what you are allowed or are not allowed to do [...]". CBED11p. This explanation is stated in relation with the subjects of "government" and "law". The not-for-profit industry consortium "Object Management Group" (OMG) furthermore explains a "rule" as a "proposition that is a claim of obligation or of necessity". OMG08, p. 160.

²⁰⁶Data are further explained in section 2.1.2 of this thesis.

²⁰⁷Section 2.1.3 gives a description of the term "information".

²⁰⁸The Cambridge Business English Dictionary explains "technology" firstly as "the use of scientific knowledge or processes in business, industry, manufacturing, etc. [...]" and secondly as "new machinery and equipment that has been developed using scientific knowledge or processes [...]". CBED11q.

The rules determine how the process is executed; they give instructions on how the implementation can take place. Therefore, certain questions are asked, and answered correspondently, to know which actions have to be assigned, one after the other. The rules in turn are defined by data and information on the one hand, and technology on the other. Data and information are the source of the rules' content-design, which is found in in-place regulations on compliance and available models for measuring and reporting intellectual capital. Complementary, the technology delivers the technical structure of the rules, which means on what technology their design is based, precisely how the rules are formulated and displayed. For this, the concept of "business rules"²⁰⁹ is used.

Figure 3.2 also shows the defining elements of the whole process as steps and in the order

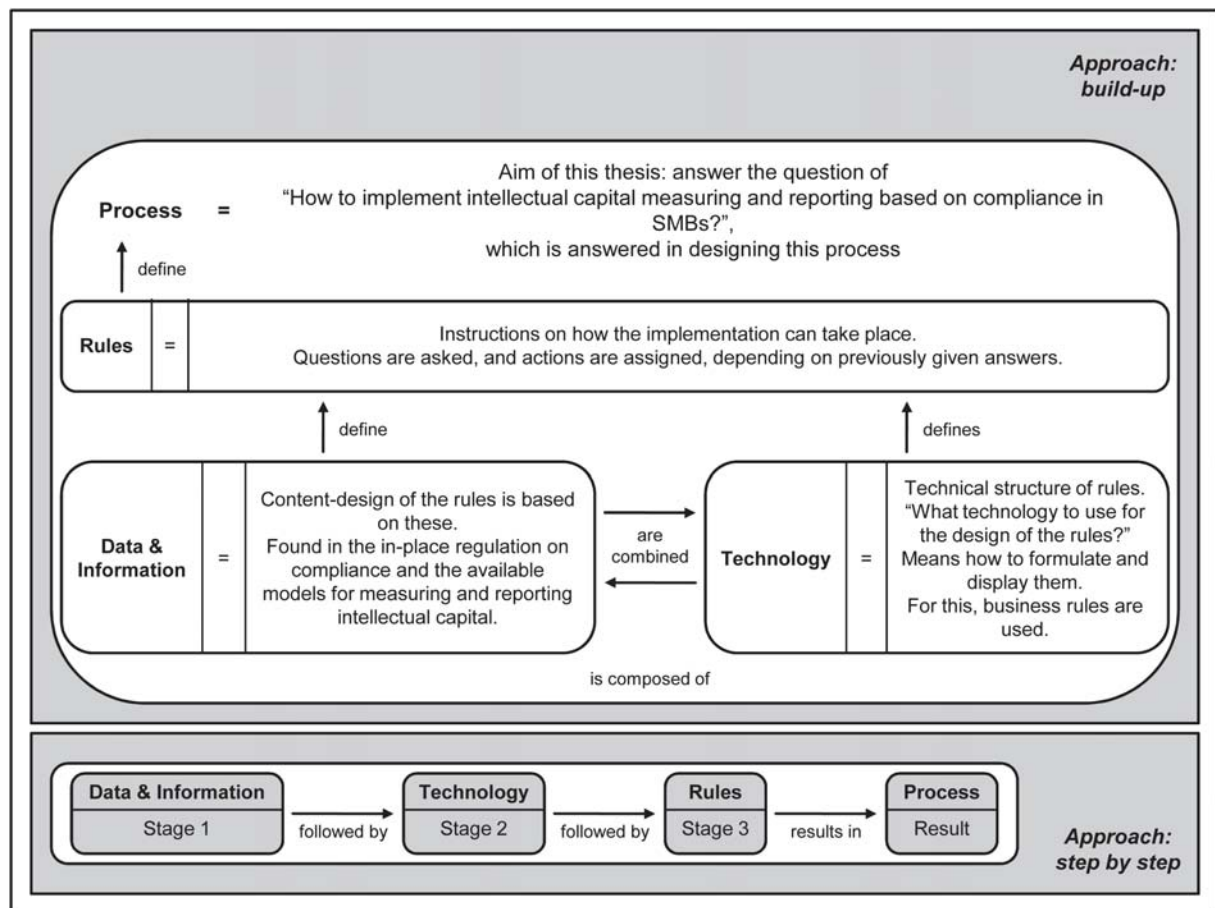


Figure 3.2: Approach of the Thesis

they are carried out to achieve the final result. The sequence starts with analyzing the data and information, over determining which technology to use, and the design of the rules, until the process is finished and completed at the end. In the following, the starting points of the single steps in the thesis' approach are marked as in Figure 3.2.

²⁰⁹This concept as well as further details on the application of business rules within the scope of this thesis are illustrated in section 8 of this thesis.

3.3 Target Group

As explained above, the outcome of this thesis – a business rules system – is meant as supporting tool for small and medium-sized businesses for implementing an intellectual capital measuring and reporting plus compliance management in their organization. Due to their limited financial resources²¹⁰ the average SME is compiling their intellectual capital statement intra-company.

Within the firm ideally the information systems department, in cooperation with human resources, shall work with this instrument. The Cambridge Business English Dictionary defines "information system" in the context of IT and the workplace as "a computer system within a company or organization for sharing information [...]"²¹¹ Human resources furthermore is explained there as "the department of an organization that deals with finding new employees, keeping records about all the organization's employees, and helping them with any problems [...]"²¹² Hence, both domains of information systems as well as human resources work at the core of the intellectual capital. Therefore, both together shall work as the knowledge managers on building and maintaining an intellectual capital measuring and reporting in the organization. One further reason why the human resources department is meant to work with the business rules system was already argued by Thomas A. Stewart: "HR plays a leading role in only a fifth of corporate knowledge-management efforts. HR is so marginalized – wrongly [...] that in almost half of these efforts it's not even involved in rewards, compensation, and employee retention; only in training does the department play a significant role [...]"²¹³ One of human resources goals should consist in crossing out the value of the employees, and this could be very well done by implementing and maintaining an intellectual capital measuring and reporting system.

Summarizing, now not only the actual approach of this thesis has been explained, but also the reasons for choosing the thesis' subject at all. Moreover, it has been explained for whom the outcome of this thesis is intended and why this is recommended.

²¹⁰The characteristics of small and medium-sized businesses are amplified in section 6 of this thesis.

²¹¹CBED11r.

²¹²CBED11s.

²¹³Stew03, pp. 111-112.

Chapter 4

Effective Regulations on Compliance

With regard to the approach and process illustrated above²¹⁴, stage 1 "data & information" is going to be treated in the following pages.

Data & Information
Stage 1

Today (corporate) compliance is vital for every investor and manager. Investors – as well as other stakeholders – need to know the figures and numbers in financial and annual reports are reliable to decide on their investment opportunities. Managers, on the other hand, should aspire this trustworthiness as well as have to comply with the in force regulations to be conformable to law. This statement is confirmed by regulatory compliance experts Terence Sheppey and Ross McGill who write: "A company that can demonstrate its compliance demonstrates its likely financial integrity. This demonstration underpins its trustworthiness."²¹⁵

While in Austria and Germany the legislative authority is responsible for regulating the financial accounting, in the United States of America it is supervised by accounting bodies under private law.

The following chapter is focused on the regulations on compliance management in place. For the purpose of this thesis, a number of well-known examples of regulatory compliance all over the world are introduced and looked upon in some detail. They are explained on the following pages and grouped by territorial validity. Of all of these guidelines the ones applicable to small and medium-sized businesses are then selected and taken into further analysis.

²¹⁴This thesis' approach and an explanation of the process underlying it can be found in section 3.2 of this thesis.

²¹⁵ShMc07, p. 78.

4.1 International Regulations

Of all the regulations the first group to be introduced are the ones which were developed at an international level and are intended for global use. These comprise the OECD Principles of Corporate Governance, the IFRS as well as BASEL II & III.

4.1.1 OECD Principles of Corporate Governance

The first time the OECD²¹⁶ Principles²¹⁷ were published was in 1999, and an updated version was released in 2004 – which is also the latest available version at the moment. They give non-obligatory advice and propose standards on corporate governance and are frequently used as basis for regulation and laws enacted by single states. The OECD Principles comprise, for example, the topics of disclosure of company information and rights of shareholders.²¹⁸

4.1.2 IFRS (International Financial Reporting Standards)

The IFRS were prepared by the IASB, which stands for "International Accounting Standards Board", headquartered in the United Kingdom. They are based upon the IAS, which are the "International Accounting Standards", and came into effect on January 1st, 2005. The IFRS' aim is to create and introduce globally valid accounting standards by – amongst other things – co-operating with individual countries, with the intent to consolidate their national accounting standards. Since its coming into force, all companies which have shares listed at any of the EU-based stock exchanges have been obliged to apply the IFRS. Basically, this means preparing their financial reporting in compliance with it.²¹⁹ There also exist equivalents to the IFRS in the European Union (EU) or Australia, for instance, but these are much less popular.

More interesting for the purpose of this thesis is the fact that the IASB also released "IFRS for SMEs" in 2009. Therein also a definition of an SMB is found. In Section 1, 1.2 it says that "Small and medium-sized entities are entities that: (a) do not have public accountabil-

²¹⁶The OECD is the Organization for Economic Co-operation and Development and at the moment has 34 member states from all over the world. Besides others, Austria, Germany, Switzerland, the United Kingdom, Japan, Mexico and the United States belong to it.

²¹⁷Cf. OECD04.

²¹⁸Cf. Menz06, pp. 9 ff.

²¹⁹Cf. ShMc07, pp. 85-86.

ity²²⁰, and (b) publish general purpose financial statements for external users. [...]"²²¹

Besides the IFRS, there exists another internationally valid accounting regulation, namely the US GAAP (United States Generally Accepted Accounting Principles). These are explained in section 4.3.2 of this thesis.

4.1.3 BASEL II & BASEL III

BASEL II²²² is actually "The International Convergence of Capital Measurement and Capital Standards: A Revised Framework". It is an enhancement of BASEL I from 1988 and was assembled by the "Basel Committee on Banking Supervision" which is a committee established by the Group of Ten (G10)²²³. Initially it was published in 2004 and finally put into force on January 1st, 2007. The prime objective for introducing this framework, as formulated within the written down regulation, was "[...] to secure international convergence on revisions to supervisory regulations governing the capital adequacy of internationally active banks."²²⁴

The BASEL II regulation comprises three pillars which have to be complied with. The first one "Regulatory Capital" deals with the topic of regulatory equity capital, precisely for credit, market and operational risks: how it should be allocated and how the capital rate for it should be calculated. It opts for a variable capital charge, depending on the credit risk. This risk is determined by credit ratings which are based on annual reports or financial plans, but also on intellectual capital like the management of a company or its employees. Credit ratings according to BASEL II can be realized internally or externally while most of the obliged banks decide for conducting it by themselves. Especially SMBs will opt for doing an internal credit rating due to the high costs involved when done externally. Internal ratings do often include checklists where financial as well as intellectual capital must be considered. Financial figures in medium-sized businesses represent about 50 to 70 per cent, thus intellectual

²²⁰The IFRS for SME's furthermore explain what is meant by the term "public accountability". "An entity has public accountability if: // (a) its debt or equity instruments are traded in a public market or it is in the process of issuing such instruments for trading in a public market (a domestic or foreign stock exchange or an over-the-counter market, including local and regional markets), or // (b) it holds assets in a fiduciary capacity for a broad group of outsiders as one of its primary businesses. This is typically the case for banks, credit unions, insurance companies, securities brokers/dealers, mutual funds and investment banks." IFRS12, p. 10, Section 1, 1.3.

²²¹IFRS12, p. 10.

²²²Cf. BIS09.

²²³The G10 is an association of – meanwhile – eleven industrial nations, comprising Canada, the United States of America, France, Belgium, Germany, Italy, the United Kingdom, the Netherlands, Sweden, Japan and Switzerland.

²²⁴BCBS06, p. 1.

assets amount 30 up to 50 per cent of total indicators, as Jutta Rump and Gaby Wilms state.²²⁵ So again it is to be observed that managing intangible assets is crucial – here for getting a credit rating as good as possible –, although the ratings are still lacking standards and methods for the assessment of intellectual capital.

BASEL II's second column "Supervisory Review" introduces the monitoring process of the actions explained in pillar one, done by the organization's board of directors. Furthermore, it obliges firms to as well manage their risks. Finally, the third column "Market Disclosure" addresses the companies' duty to publish information about their risks and equity capital.²²⁶ For the computation and the assessment of the credit ratings BASEL II furthermore advises organizations to investigate also their in-place risk management, their information and communications technology and their environmental management. In this context, Rump and Wilms argue that "[t]his has to hold true also for intellectual capital statements [...]. Intellectual capital reports provide the opportunity of displaying knowledge and competences which are critical for success as well as the innovation potential of the organization in a structured way."²²⁷

In December 2010, a further improvement of BASEL II was made public, namely BASEL III²²⁸. This new regulation again uses the three pillar model of its predecessor, enhanced and updated. Moreover, it introduces standards for liquidity ratios and its risk management and supervision.²²⁹ BASEL III is planned to become applicable with January 1st, 2013.²³⁰ BASEL II's and BASEL III's regulations primarily aim at the financial services sector. According to these regulations, furthermore, a small and medium-sized business is defined as having up to 500 employees and annual sales below 50 million euros.

4.2 European Regulations

Besides the international regulations, there are also laws and directives existent which focus on the European area. Besides others, these include SOLVENCY I & II, the MiFID and the

²²⁵Cf. RuWi07, p. 40.

²²⁶Cf. finm12a.

²²⁷German original, translated by the author; cf. RuWi07, p. 40: "Dies muss auch für Wissensbilanzen gelten [...]. Wissensbilanzen bieten die Möglichkeit, erfolgskritisches Wissen und erfolgskritische Kompetenzen sowie das Innovationspotenzial des Unternehmens strukturiert darzustellen."

²²⁸Cf. BIS12.

²²⁹An insight into the enhanced three pillars of Basel III and its standards for liquidity ratios can be found under <http://www.bis.org/bcbs/basel3/b3summarytable.pdf> (Bank for International Settlements: Basel Committee on Banking Supervision reforms - Basel III, Access: 2012-05-18).

²³⁰Cf. finm12b.

EuroSOX.

4.2.1 SOLVENCY I & SOLVENCY II

SOLVENCY I²³¹ was implemented by the Commission of the European Union, primarily in the 1970s. The CEA²³², which is the European insurance and reinsurance federation, names the EU's prime intent underlying the introduction then: "These [capital requirements specified in SOLVENCY I] were intended as a buffer to absorb potential risks, to act as a policyholder protection measure [...]"²³³ Furthermore, the regulations of SOLVENCY were cardinally published for companies operating in the insurance and reinsurance businesses. The updated and enhanced version, SOLVENCY II, is planned to become effective in 2014; until then, the former edition will be valid. The CEA gives this short summary on the new SOLVENCY II²³⁴: "Solvency II is based on three 'Pillars':

- Pillar I, which focuses on quantitative requirements: valuing assets, liabilities and capital
- Pillar II, which focuses on supervisory activities: which provides qualitative review through the supervisory process including a focus upon the company's internal risk management processes
- Pillar III, which addresses supervisory reporting and public disclosure of financial and other information by insurance companies".

4.2.2 MiFID (Markets in Financial Instruments Directive)

The EU directive MiFID primarily aimed at investment firms in the European Economic Area. Organizations whose prime business objective is investment services have to obey the MiFID. It came into force in 2007 with the objective to better protect consumers in this branch of business. According to MiFIDirective.com the main topics the MiFID deals with are "Authorisation, regulation and passporting, Client categorisation, Client order handling, Pre-trade transparency, Post-trade transparency, Best execution and Systematic Internaliser".²³⁵

²³¹Current valid rules of SOLVENCY I are found at EuC12.

²³²CEA actually stands for "Comité Européen des Assurances". The reason for its French name is that it is based in Brussels, Belgium.

²³³CEA07, p. 3.

²³⁴CEA07, p. 3.

²³⁵MiFID12, front page.

Title II of the directive, for instance, obliges all EEA members to compile and administer a list including all investment firms based in their country. Moreover, every business whose managers plan to engage in the investment sector is requested to be authorised by their government to do so. Furthermore, these organizations have to meet a certain minimum concerning their initial capital. There, the MiFID also dictates that "[a]n investment firm shall have sound administrative and accounting procedures, internal control mechanisms, effective procedures for risk assessment, and effective control and safeguard arrangements for information processing systems."²³⁶ Title II furthermore obliges investment firms to safeguard that they do obey to the requirements on which they were authorised in the beginning. The MiFID also includes the "Obligation to execute orders on terms most favourable to the client"²³⁷. It additionally asks for comprehensive reporting of business activities, including transactions. Interestingly, the directive does not only commit firms to compliance but also grants them special rights, cardinally the "Freedom to provide investment services and activities"²³⁸. Moreover, TITLE III of the MiFID extensively handles with regulated markets, for example that the company's management has enough expertise to deal with it appropriately. Additionally, those responsible of the regulated market themselves have to implement a monitoring system of their participants. TITLE IV then focuses on "Competent Authorities" which have to be installed in each EEA member state. These countries do also have to collaborate with other members, regarding issues on the monitoring of their authorised firms, and other subjects like the "Exchange of information"²³⁹. A similar obligation concerns the communication with other nations.

4.2.3 EuroSOX

EuroSOX²⁴⁰ is also an EU directive, actually named directive 2006/43/EC. It was developed by the European Commission and released by the European Parliament and the Council in 2006. Their intent was to optimize the accuracy of financial reporting and to prevent future fraud. Subjects of the directive are, among others, the independence of auditors and the improvement of auditing itself.²⁴¹

²³⁶EuPC04, TITLE II, CHAPTER I, Article 13, 5., p. 14.

²³⁷EuPC04, TITLE II, CHAPTER II, Section 2, Article 21, p. 18.

²³⁸EuPC04, TITLE II, CHAPTER III, Article 31, p. 25.

²³⁹EuPC04, TITLE IV, CHAPTER II, Article 58, p. 25.

²⁴⁰Cf. EuPC06.

²⁴¹Cf. CdEC04.

4.3 United States' Regulations

After the introduction of European regulations on compliance, the next ones to be considered are the ones developed in the United States of America. Prominent examples belonging to these are the SOX, the US GAAP, the HIPAA, and the FATCA.

4.3.1 SOX (The Sarbanes-Oxley Act of 2002)

The Sarbanes-Oxley Act of 2002 was compiled by the U. S. Securities and Exchange Commission – SEC in short – which is the regulatory authority of the stock exchange in the United States of America, and was released on July 30th, 2002. SEC's cardinal intent in elaborating it is stated in the Act itself: "To protect investors by improving the accuracy and reliability of corporate disclosures made pursuant to the securities laws [...]." ²⁴² It basically deals with the issues of implementing a public company accounting oversight board, corporate responsibility, corporate and criminal fraud accountability, enhancement of financial disclosures, the independence of auditors, commission resources, and authority and analyst conflicts of interest. The Sarbanes-Oxley Act frequently refers to the "Securities Exchange Act of 1934", so the latter can be seen as foundation of the former.

The Sarbanes-Oxley Act embraces the following headlines ²⁴³:

- TITLE I, Sections 101-109: PUBLIC COMPANY ACCOUNTING OVERSIGHT BOARD
- TITLE II, Sections 201-209: AUDITOR INDEPENDENCE
- TITLE III, Sections 301-308: CORPORATE RESPONSIBILITY
- TITLE IV, Sections 401-409: ENHANCED FINANCIAL DISCLOSURES
- TITLE V, Section 501: ANALYST CONFLICTS OF INTEREST
- TITLE VI, Sections 601-604: COMMISSION RESOURCES AND AUTHORITY
- TITLE VII, Sections 701-705: STUDIES AND REPORTS
- TITLE VIII, Sections 801-807: CORPORATE AND CRIMINAL FRAUD ACCOUNTABILITY

²⁴²CUSA02, p. 1.

²⁴³CUSA02, pp. 1-2.

- TITLE IX, Sections 901-906: WHITE-COLLAR CRIME PENALTY ENHANCEMENTS
- TITLE X, Section 1001: CORPORATE TAX RETURNS
- TITLE XI, Sections 1101-1107: CORPORATE FRAUD AND ACCOUNTABILITY

The most relevant parts of SOX for the purpose of this thesis are cited in the next paragraph. TITLE I introduces the "Public Company Accounting Oversight Board" (PCAOB). This is, for instance, responsible for "Inspections of Registered Public Accounting Firms" (section 104 SOX), done regularly to control the firm's auditing and their audit reports. While section 106 SOX "Foreign Public Accounting Firms" obliges companies from outside the United States to comply with the Act, "Accounting Standards" are introduced in section 108 SOX. Furthermore, TITLE II claims for "Audit Partner Rotation" (section 203 SOX) every five years and the avoidance of "Conflicts of Interest" (section 206 SOX). TITLE III, section 301 SOX "Public Company Audit Committees" introduces this committee as an independent control mechanism of the firm's financial accounting and the auditor. Section 302 SOX "Corporate responsibility for financial reports" then deals with the documents and numbers companies have to release. These have to be complete and accurate, and for the purpose of controlling these publications control mechanisms have to be implemented. Furthermore, TITLE IV, section 401 SOX "Disclosure in Periodic Reports" obliges companies to release financial reports which are complete and accurate, and to annually publish off-balance sheet arrangements that may have an influence on the finances of said organization. In section 404 SOX "Management Assessment of Internal Controls" the requisite of implementing and servicing effective internal controls is imposed on firms. This effectiveness has to be guaranteed by the CEO and the CFO, and the annual report has to include records of the controls. Section 406 SOX then obliges organizations to introduce a "Code of Ethics for Senior Financial Officers". TITLE VI furthermore lists, for instance, "Qualifications of Associated Persons of Brokers and Dealers" (section 604 SOX). TITLE VII widely handles with the studies and reports which have to be conducted and compiled by the Securities and Exchange Commission. Moreover, TITLE VIII and IX deal with subjects concerning punishments in case of a violation of the Sarbanes-Oxley Act. Section 802 SOX "Criminal Penalties for Altering Documents", for example, names sentencing, fines and imprisonment as consequences. Someone committing securities fraud, for instance, can be adjudged to a prison sentence of up to 25 years, as stated in section 807 SOX "Criminal Penalties for Defrauding Shareholders of Publicly Traded Companies".

All companies which have stocks listed at a US stock exchange – i.e. at the NYSE²⁴⁴, the NASDAQ, or the AMEX²⁴⁵ – and which have to register with the SEC have to comply with SOX, independent of the country they are based in. It is also important to know that all their subsidiaries have to obey to the Sarbanes-Oxley Act as well.²⁴⁶ In addition, Terence Sheppey and Ross McGill argue that "[w]hile there has been some shift in the attitude of the SEC on the burden of compliance for smaller companies and non-US entities, the requirements remain and are substantial."²⁴⁷

4.3.2 US GAAP (United States Generally Accepted Accounting Principles)

As the name already implies, the US GAAP are the principles for adequate and orderly accounting in force in the United States of America. One main reason for implementing these was to provide interested stakeholders extensive business information, especially for taking investment decisions. The principles have been assembled since the 1930s and are today released by the FASB, which is the "Financial Accounting Standards Board". The FASB is a committee under private law dedicated "[...] to establish and improve standards of financial accounting and reporting that foster financial reporting by nongovernmental entities that provides decision-useful information to investors and other users of financial reports."²⁴⁸ The US SEC, which – as already explained above – regulates the trade at the US stock exchanges and sets the guidelines for companies operating there, approved the US GAAP. This basically connotes that all businesses listed at an US American stock exchange are constrained to apply the US GAAP. These principles are not merely a compilation of legislative texts but based on case law.

Besides the US GAAP, other versions of Generally Accepted Accounting Principles are in place in other countries, for instance the UK GAAP in the United Kingdom. Organizations can resort to these GAAPs for support on preparing their annual reports et cetera.²⁴⁹ Momentarily, discussions are taking place on the existent differences between the IFRS and the US GAAP. The ultimate goal is to eliminate these distinctions and approximate the two regulations. These would directly be to the organizations' benefit: for instance, that US

²⁴⁴NYSE stands for "New York Stock Exchange".

²⁴⁵AMEX is the abbreviation of "American Stock Exchange".

²⁴⁶Cf. Menz04.

²⁴⁷ShMc07, p. 3.

²⁴⁸FASB12.

²⁴⁹ShMc07, pp. 84-85.

based firms will perhaps not have to compile two different annual reviews but be allowed to publish solely their financial report in accordance with the IFRS.²⁵⁰

4.3.3 HIPAA (Health Insurance Portability and Accounting Act)

The HIPAA was developed in the year 1996. Primary objectives for this are cited in the act itself, namely "[...] to improve portability and continuity of health insurance coverage in the group and individual markets, to combat waste, fraud, and abuse in health insurance and health care delivery, to promote the use of medical savings accounts, to improve access to long-term care services and coverage, to simplify the administration of health insurance [...]".²⁵¹ All that means, for instance, that the HIPAA demands organizations operating in the health industry, besides other concerns, to implement and enhance their internal control mechanisms and improve the handling of health information of US citizens.

4.3.4 FATCA (Foreign Account Tax Compliant Act)

The "Foreign Account Tax Compliant Act" is a United States' regulation concerning the tax compliance of foreign financial assets. The Foreign Account Tax Compliant Act is primarily aimed for banks and other companies operating in the financial services sector. It was published by the IRS, which stands for Internal Revenue Service of the US federal government, and primarily brought into effect in 2010. This year the date was postponed to 2013: then the FATCA shall become valid step by step, owing to further discussions with some foreign countries' governments regarding the complex requirements their businesses shall meet when complying with the FATCA. Due to this Act, US American businesses have to annually convey information on certain foreign financial assets directly to the IRS. Additionally, it was planned that those foreign financial institutions of which national organizations do have financial accounts should as well inform the IRS on this fact. Again, this detail was updated in 2012 so that the firms now shall have to send their documents to their national revenue authorities; in case of non-compliance businesses shall get amerced. Foreign organizations falling in this description furthermore shall have to pay the IRS taxes regarding US-related earnings.²⁵²

²⁵⁰Cf. GAAP12.

²⁵¹CUSA96, p. 110 STAT. 1936.

²⁵²Cf. IRS12, pwc12.

4.4 Other National Regulations

Finally, besides introducing compliance regulations with an international, a European or a US American focus, other national regulations are regarded and explained in the following. These include the national codices of corporate governance or the German KonTraG, among others.

4.4.1 National Codices of Corporate Governance

There do exist own codices of corporate governance in several countries. The one of Austria²⁵³, for instance, was developed by the "Austrian Corporate Governance Workgroup" (in German "Österreichischer Arbeitskreis für Corporate Governance"). This group of experts in the field designed the code on behalf of the Austrian government. It was primarily published on October 1st, 2002 and is revised annually and amended regularly to enable it being as up-to-date as possible. It shall serve as guidance for executives on how to operate good corporate management. Besides other laws and regulations, the Austrian Code relies on the OECD Principles of Corporate Governance from above.

All companies which have stocks listed at the Prime Market of Vienna's Stock Exchange (VSE)²⁵⁴ do have to obey to the Austrian Code of Corporate Governance, with one exception: organizations based in the European Union or the European Economic Area (EEA) are allowed to apply their home countries' principles of corporate governance.

Moreover, the so-called ICR-scheme is used concerning the kinds of rules within the regulation: Legal requirements (L) have to be complied with; Comply or explain-rules (C) are not directly obligatory, but an explanation has to be given if they are not applied; and Recommendations (R) are utilized which solely give advice and are not mandatory at all.

The following list gives an overview of the subjects dealt with in the Austrian Code of Corporate Governance²⁵⁵:

- Preamble
- Shareholders and the General Meeting
- Cooperation between the Supervisory Board and the Management Board

²⁵³Cf. AWGCG12.

²⁵⁴Shares listed at the prime market of the Vienna Stock Exchange have to comply with extra requirements in comparison with the ones listed at the other markets of the VSE.

²⁵⁵AWGCG12, p. 7.

- Management Board
- Supervisory Board
- Transparency and Auditing

Particularly interesting in the context of this thesis is the last topic of the code. There it also says that all financial reports have to be prepared according the IFRS.

The German equivalent of the Austrian Code of Corporate Governance was as well made public in 2002 – and also redrafted already – and pursues a similar objective.²⁵⁶

4.4.2 KonTraG (Corporate Sector Supervision and Transparency Act)

The German KonTraG²⁵⁷, which is the abbreviation of "Gesetz zur Kontrolle und Transparenz im Unternehmensbereich", was released by the German Bundestag in 1998. Its intent in implementing this act was to improve the corporate governance within German businesses. The KonTraG obliges the majority of companies to introduce a risk management system in their organization and therefore addresses the issue of risk management in great depth. Of all risks the most critical ones are considered to be personnel-related risks, which KonTraG divides into four categories: a shortage risk (which refers to a lack of (high) performers), a turnover risk (which means that high performers are endangered), an adaption risk (which refers to wrongly qualified employees) and a motivational risk (which relates to withheld work). Personnel-related risk management then should incorporate several steps, namely risk identification (what is the risk?, when did it occur?, what could be consequences of the risk?), risk measurement (find indicators and evaluate risks, basis could be historical data or actual estimations), risk steering (what can be done to avoid risks or diminish them?) and risk monitoring (how do risks develop over time?).

4.5 Further Regulations

Finally, some further regulations and frameworks are explained, including COSO and COBIT, and the listing standards of stock exchanges.

²⁵⁶Cf. Menz06, pp. 59 ff.

²⁵⁷Cf. GeBt98.

4.5.1 COSO

The "Committee of Sponsoring Organizations of the Treadway Commission" – in short COSO – is a US organization established in 1985 out of the private sector. COSO provides a framework – released in 1992 and updated in 2004 – to which companies can match their internal controls and standards. This framework comprises the five parts of "control environment", "risk assessment", "control activities", "information and communication", and "monitoring". The "control environment" constitutes the foundation of the organization's management of internal controls. It deals with the surroundings necessary for the companies' internal controls and gives recommendations on the implementation of these. Another vital component of the framework is the "risk assessment" component. It has to appraise the various risks the firm faces and to manage them. Then, "control activities" define what has to be monitored and how this supervision should be done. Another important point the framework focuses on is the handling of "information and communication". "The identification, communication, and management of information is central to the effectiveness of controlling the value of business.", as Terence Sheppey and Ross McGill comment.²⁵⁸ The last part of the COSO framework, finally, is the "monitoring" which advises supervision of the internal control system. This shall help in obtaining as well as retaining a reliable internal control system.

4.5.2 COBIT

COBIT is the abbreviation for "Control Objectives for Information and related Technology" and was primarily published in 1993. Like COSO, it is also a framework for supporting businesses' internal control systems. COBIT was developed by the ISACA, which stands for "Information Systems Audit and Control Association"²⁵⁹. Sheppey and McGill explain the concept in this way: "The relationship between financial reporting, IT functions, COSO recommendations, and reference frameworks for managing IT and security is meshed together within the concept known as COBIT [...]. It bridges the perceived gaps between business risks, control needs, and technical issues [...]. All three of these linked subjects are pertinent to the compliance process, and COBIT offers a unique approach for managing the complexities of these relationships."²⁶⁰ COBIT does so by supporting organizations

²⁵⁸ShMc07, p. 307.

²⁵⁹The ISACA is an association of experts on the topic of IT governance.

²⁶⁰ShMc07, pp. 311-312.

with recommendations on how to carry out compliance management and provides tools for implementing its framework; it also uses standards and definitions of COSO. Additionally, COBIT also suggests composing a balanced scorecard modelled on the equally named one by Kaplan and Norton²⁶¹ with the main purpose here of settling the company's strategy.

To be more exact about what COBIT comprises, the framework names four groups of control objectives it deals with: "planning and organization", "acquisition and implementation", "delivery and support", and "monitoring". "Planning and organization" handles various subjects from defining information architecture, over assessing risks, to managing projects and quality. "Acquisition and implementation" then focuses on the provisioning of software and technology for the implementation of the framework as well as change management. In the third part of COBIT "delivery and support" subjects related to customers, performance and related management (e.g. of problems, data or operations) are treated. Finally, "monitoring" gives businesses suggestions on the supervision of the implemented internal controls.²⁶²

COBIT serves as foundation for the Val IT framework²⁶³ which was also designed by the ISACA and provides guidance for the management of business investments.

4.5.3 Listing Standards of Stock Exchanges

Many stock exchanges worldwide have developed and published standards on corporate governance and compliance. Besides others, the stock exchange of New York, London and Frankfurt released some. All businesses wanting to trade their shares at a stock exchange have to apply their listing standards. They were basically implemented to regulate the stock exchange and to allow orderly trade there. Listing standards are partly obligations, partly recommendations for companies on how to behave accurately and what numbers and reports to disclose et cetera. Moreover, foreign private issuers, for instance, do sometimes have the freedom of choice which corporate governance standards to obey to. They can choose between applying those of their mother country or those of the country at whose stock exchange their shares are listed at.

Some listing standards are also related or referring to particular national or international

²⁶¹The Balanced Scorecard is explained in detail in this thesis' section 5.1.6.1.

²⁶²Cf. ShMc07, pp. 332 ff.

²⁶³The ISACA explains the Val IT framework and its connection with COBIT in this fashion: "Val IT is a complete framework covering value governance, portfolio management and investment management processes and activities. It is closely aligned with and complements COBIT, but delivers value to enterprises in its own right. While COBIT ensures that IT is working as effectively as possible to maximize the benefits of technology investment, Val IT helps enterprises make better decisions about where to invest, ensuring that the investment is consistent with the business strategy." ISACA12, p. 3.

laws. The Frankfurt Stock Exchange, for instance, obliges their listed companies to fulfil requirements of the German Stock Exchange Act ("Börsegesetz") and Securities Trading Act ("Wertpapierhandelsgesetz"), and issue their annual financial statement in accordance with the IFRS/IAS²⁶⁴ or US-GAAP^{265, 266}.

Besides introducing some regulations on compliance, stage 1 of this thesis' process as explained above asks for explaining a couple of approaches on measuring and reporting intellectual capital, which is done in the next pages.²⁶⁷

²⁶⁴More information on the IFRS/IAS can be found in this thesis' section 4.1.2.

²⁶⁵The US-GAAP is explained in section 4.3.2 of this thesis.

²⁶⁶Cf. Menz06, pp. 31 ff.

²⁶⁷This process as well as the approach of this thesis are explained in detail in section 3.2.

Chapter 5

Existing Approaches on Intellectual Capital Measuring and Reporting

Similar to the introduction to and explanation of in place regulations on compliance management in the previous chapter, the same is to be done in the following concerning approaches on intellectual capital measuring and reporting. It is started with the methods in measuring intellectual capital.

5.1 Methods on Measuring Intellectual Capital

"If you can't measure it, you can't manage it." This phrase is well-known by managers, and possibly also among the majority of people doing business in one or the other way. Although it is not definitely determined who primarily said this it is nevertheless true, for tangible as well as for intangible assets.

Thomas A. Stewart assents to this statement when arguing "[m]easurement [...] is a world-view, not just a scorecard. It is a means of thinking and acting, as well as measuring. Unless you measure knowledge assets and activities, your ability to change will be hindered. [...] Knowledge measurements – analyses of intellectual capital and the effectiveness and productivity of knowledge work – should be made so that businesspeople judge their acts and improve their decisions."²⁶⁸

Jeffrey A. Cohen holds the same view, although he as well points to the difficulties that may accompany the measurement of intangibles: "Sometimes identifying a firm's intangible assets is hard, but valuing them is easy. Other times just the opposite is the case. Iden-

²⁶⁸Stew03, p. 291.

tification is largely what makes valuing intangible assets different from valuing tangible or physical assets. For analysts or managers, finding and quantifying the intangible assets of a firm improves the valuation, whether that valuation supports a transaction, litigation, or strategic improvement of the firm's operations."²⁶⁹ Moreover, Liz Taylor, expert in knowledge and information management, declares that "[t]his type of valuation will provide a more accurate picture of what can be exploited to gain competitive advantage and the ability to develop strategically in the market sector. Furthermore, it provides valuable management information as to what is actually important to an organisation in terms of knowledge and information, and enabling it to conduct its business."²⁷⁰

There are various approaches on estimating and calculating intellectual capital existent, or only measuring human capital (or solely structural or relationship capital) individually. "In recent years, the use of financial transactions to show the true value of an organisation has often been questioned in various articles and journals, but using any other means is fraught with difficulty. It is often difficult to decide upon a suitable measure, as it will usually introduce an element of subjectivity."²⁷¹ Taylor argues. For companies, "[t]he key point is to select ways to measure intellectual capital and knowledge management that illuminate your strategy and your financial performance"²⁷², as Thomas A. Stewart already said in 2003.

In the following, the focus is laid mostly on measurement methods which look upon intellectual capital on the whole. The differentiation between the various approaches is based on the one made by Wilhelm Schmeisser and Martina Lukowsky in their book "Human Capital Management"²⁷³ and then enlarged even further, using Daniel Andriessen's "Making Sense of Intellectual Capital"²⁷⁴, among others. Not all of the computation and assessment methods are looked upon in the same level of detail to sustain broad comprehension and avoid too much complexity.

For further analysis, market value oriented models, revenue oriented models, value added approaches and non-monetary as well as monetary indicator based models were taken into account.

²⁶⁹Cohe05, p. xii.

²⁷⁰Tayl07, p. 3-4.

²⁷¹Tayl07, p. 3.

²⁷²Stew03, p. 293.

²⁷³Cf. ScLu06, pp. 17-91.

²⁷⁴Cf. Andr04a.

5.1.1 Market Value Oriented Models

The Market Value Oriented Models include the Market Value/Book Value Difference, the Market-to-Book Ratio, the Human Capital Market Value and Tobin's q. These measuring methods can only be used for companies whose shares are listed at the stock exchange. Critics to these approaches argue that they are not very meaningful as they are based on the stock market and its prices which are very volatile. Furthermore, to compare market and book value is difficult, because the market value is an actual number while the book value is not. Other doubts regarding the usefulness of the Market Value Oriented Models concern their superficiality and lack of doing detailed calculations on the value of individual intangible assets, and the general scepticism regarding the alleged frequent understatement of the market value.²⁷⁵

5.1.1.1 Market Value/Book Value Difference

The Market Value of the enterprise is defined as:

$$\text{Market Value} = \text{Price per Share} \times \text{Total number of Shares outstanding}$$

The book value, which is also needed for the calculation, is taken from the accounting's balance sheet. Intellectual capital then is computed in this way:

$$\text{Intellectual capital} = \text{Market Value} - \text{Book Value}^{276}$$

5.1.1.2 Market-to-Book Ratio

This approach as well as the "Market Value/Book Value Difference" are basically applied for making a comparison between an organization's book value (e.g. out of their financial report) and its current market value. The Market-to-Book Ratio is also named "Price-to-Book Ratio" or "Price-to-Equity Ratio". It is calculated as:

$$\text{Market-to-Book Ratio} = \text{Market Value} / \text{Book Value}$$

This method can either be used for observing the ratio of one company over time and comparing the different ratios, or for checking one enterprises' ratio with the one of a competitor or even the industry ratio.²⁷⁷

²⁷⁵Cf. Andr04a, Nort11.

²⁷⁶Cf. Andr04a.

²⁷⁷Cf. Andr04a.

5.1.1.3 Tobin's q

This calculation method was developed by the US American economist and Nobel-prize winner James Tobin, who introduced it 1968. Tobin's q aims to measure the value of the intellectual capital of a company by taking the market value of the assets and comparing it with their replacement cost:

$$\text{Tobin's } q = (\text{Market Value of Equity} + \text{Debt}) / \text{Replacement cost of assets}$$

The resulting ratio – the Tobin's q – equals 1 if the market value and the replacement cost are the same. It is greater than 1 if the market values the intellectual capital more than it would cost to replace it. Schmeisser and Lukowsky²⁷⁸ furthermore argue that the greater the Tobin's q, respectively an extremely big number, indicates that the company for which it has been calculated invests in intangible assets. If the ratio is smaller than 1, this means that the company is valued less than its assets are actually worth.

5.1.2 Revenue Oriented Models

The next group of models to discuss after the market oriented ones are the revenue oriented models. These comprise the Calculated Intangible Value, the Shareholder Value and the Weightless Wealth Tool Kit. All of these involve rather complicated calculations for which it sometimes is difficult to retrieve necessary data.

5.1.2.1 Calculated Intangible Value (CIV)

The CIV was made public in the year 1997 by NCI (National Cancer Institute) Research, a governmental agency of the United States. It is basically a comparison between a company's return on assets (ROA) and the according industry average. It offers also the possibility of evaluating the value of the enterprise's brand by matching the organization's premium on return on assets with the one of a competitor.

Thomas A. Stewart argues in the favour of the Calculated Intangible Value by saying that "[t]he value of intangible assets equals a company's ability to outperform an average competitor that has similar tangible assets."²⁷⁹ So, an increasing CIV is a positive sign for the firm, because it prefigures prospective cash flows. In reverse, a decreasing CIV shows that the business' investing activities are too much focused on tangible assets and insufficient

²⁷⁸Cf. ScLu06.

²⁷⁹Stew97, p. 227.

regarding their intangibles.

Stewart summarizes that the CIV is quite easy to measure. Furthermore, it allows the comparison of a business with its competitors, and therefore presents possible fertile investment activities. One constitutive disadvantage of this approach would be that its applicability is only feasible in the case of a positive return on assets, as Edvinsson and Brünig notice.²⁸⁰

5.1.2.2 Shareholder Value

This computation method was developed by US American economist and university professor Alfred Rappaport, primarily introduced in 1986. This approach focuses on the company's value for their shareholders and computes if the organization was able to improve it over a period of time.

For calculating the Shareholder Value the future net returns of an investor are taken and their net present value is computed. Ideally – in a so-called efficient capital market – the Shareholder Value equals the market value of the equity capital. If the Shareholder Value increases over time, it is an indicator that the knowledge-related investments of a company paid off.

5.1.2.3 Weightless Wealth Tool Kit

This financial valuation model was designed within the Netherlands-based globally operating auditor KPMG. Precisely, this was done by Daniel Andriessen, who is meanwhile Professor of Intellectual Capital at the Dutch INHOLLAND University of professional education. In 2004, the Weightless Wealth Tool Kit was published. It was elaborated in the course of a project started by the Dutch Ministry of Economic Affairs; therefore it is intended for the implementation in so-called "knowledge-intensive companies"²⁸¹ employing more than fifty people.

The method focuses on those intangible assets seen as belonging to the "core competences" of the investigated company. These are classified into five categories and not into the renowned three, these are: "endowments", "skills and tacit knowledge", "collective values and norms", "technology and explicit knowledge", and "primary and management processes". All the core competences contribute more or less to the business' success, precisely how a product is manufactured or service is carried out. So, "[t]he core compe-

²⁸⁰Cf. EdBr00.

²⁸¹Andr04a, p. 128.

tence can make an essential, substantial, or supporting contribution, but may also make no contribution at all."²⁸², as Daniel Andriessen explains.

After grouping the intellectual capital a value assessment of these is done. This means appraising their worth concerning their added value, competitiveness, potential, sustainability, and robustness. Afterwards, a financial valuation can be performed, using past, present and future fiscal data. For Andriessen, the value of the intellectual capital is the net present value of the "intangibles driven earnings" (IDE)²⁸³. These IDE are computed for each previously determined product and service of the organization. This allows drawing a competence-product matrix to show the contribution of each competence on each product and service.

Now the management can use the assessed data to decide on future changes, like working on the robustness of a specific core competence to improve a certain product. All these possibilities for action can finally be consolidated into a "Report Value Dashboard" to also clearly show the findings graphically.²⁸⁴

5.1.3 Value Added Approaches

A further class of methods on measuring intellectual capital are the value added approaches. These models are based on traditional, cost-based accountancy methods and are considered to be rather straightforward when used and implemented in a company. One disadvantage is seen in the fact that they can only be realized within a firm as insider data are needed.

The value added approaches explained here include the Economic Value Added and the Market Value Added.

5.1.3.1 Economic Value Added (EVA)

The Economic Value Added was released in 1994 by the US consulting Stern Stewart & Co. which also trademarked it. It is used as a measure for annual performance and value creation for a company's shareholders. Basically, the EVA is calculated as the profit an enterprise earned minus the cost of invested capital.

If the computed figure equals zero, the company could generate as much earnings as it had

²⁸² Andr04a, p. 393.

²⁸³ In section 5.1.6.5 of this thesis the IDE are calculated.

²⁸⁴ Cf. Andr04b.

had to pay earlier for investment capital. Furthermore, if the EVA is greater than that, the financial charges of the capital could be covered and the shareholders observe a return on capital. If it is negative, the enterprise could not gain enough profit to compensate for all costs on invested capital. So in consequence, if the EVA rises from one point of time to the next, the firm's profit increases, which could signal a market value which goes up as well. In practice, the EVA is in common use and it is, like the Shareholder Value, an indicator if investment activities in knowledge were profitable.²⁸⁵

5.1.3.2 Market Value Added (MVA)

Stern Stewart & Co. also elaborated this computation method, which is also an approach on measuring the economic profit of an organization. It can basically be calculated by subtracting the invested capital in a company from its total market value:

$$MVA = \text{Market Value of Equity and Debt} - \text{Book Value of Capital invested}$$

So the MVA allows for calculating the value gain or loss in an organization.²⁸⁶ Furthermore, as Stern Stewart & Co. explain: "MVA equals the present value of future expected EVA."²⁸⁷; the EVA was introduced above.

5.1.4 Intellectual Capital Audit

Besides the market value oriented, the revenue oriented and the value added models, there exists the Intellectual Capital Audit. This assessment method was published in 1996 and developed by Annie Brooking, consultant to high technology companies in the field of intellectual property. Her aim was basically to design a tool for auditing an organization's intellectual capital. Brooking classifies intellectual capital into market assets (like brands and customers), human-centred assets (that would be e.g. leadership or managerial skills of a company's employees), infrastructure assets (like processes and technologies which are essential for the functioning of the firm), and intellectual property (e.g. copyrights or patents).

The Intellectual Capital Audit passes through six steps, starting with defining the objectives of undertaking the audit, over identifying the company's intangible assets, determining their

²⁸⁵Cf. Schm10, pp. 27 ff.

²⁸⁶Cf. Schm10, pp. 31 ff.

²⁸⁷SSCo12.

ideal aspects, selecting the appropriate audit methods, to auditing the aspects of the assets, and its documentation and graphical preparation.

Figure 5.1 shows an example for the outcome when undertaking an Intellectual Capital Audit. In the middle of the diagram lies the target of each of the company's assets. Around this, five circles are drawn, which are named "Red", "Orange", "Yellow", "Green", and "Blue". The actual values of the intellectual assets are plotted in these circles. Those which quite meet their target values are found in the middle "Blue" area, while those with rather poor performance are located in the outer "Red" circle. Additionally, the intellectual assets' deviations from their desired values can be calculated and added up to get the overall variation. Hence, this target clearly shows the current status of the firm and its intangible assets, and their strengths and weaknesses.

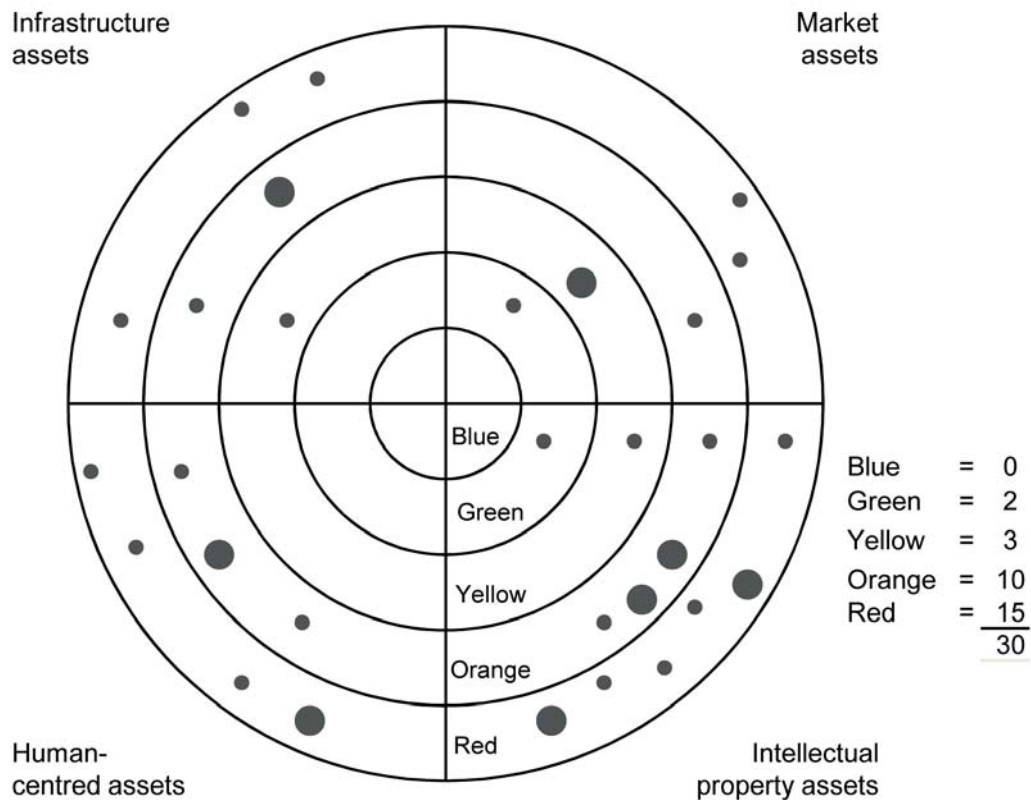


Figure 5.1: Brooking's target²⁸⁸

²⁸⁸Cf. Andr04a, p. 309.

5.1.5 Non-monetary Indicator Based Models

The next group of approaches on intellectual capital measuring are the non-monetary indicator²⁸⁹ based models. While the above named methods comprise only financial numbers, these models – as the name already reveals – focus on measures which are not based on fiscal data.

The main argument for the use of these approaches lies in the fundamental characteristics of intellectual capital: that it is intangible and difficult to express only in financial measures. But this advantage of applying these models is a handicap as well: if very subjective, difficult-to-measure indicators are determined and utilized in one company or one department, they can hardly be compared with the ones of others.

Non-monetary indicator based models which were considered in this thesis are the Intangible Assets Monitor, the Intellectual Capital Monitor, the CompanyIQ, the IC Rating, the Core-Competence Valuation, and the Intellectual Capital Benchmarking System.

5.1.5.1 Intangible Assets Monitor

This measurement method was announced in 1997 and developed by the Swede Karl-Erik Sveiby, Professor of Knowledge Management at the Hanken Business School in Helsinki (Finland) and founder of the big Swedish publishing company wearing his name. He aimed at offering a tool for not only measuring but also managing intangible assets, this as additive to the common financial accounting.

In his approach, Sveiby classifies intellectual capital similar to the classic differentiation, namely in employee competence (which equals human capital), internal structure (which matches structural capital), and external structure (which represents customer capital). The assessment starts with allocating the types of employees in the company to each of these classes. At the same time, the aim and outcome of the process is determined, precisely if the monitor should be used for external presentation, or if it should serve as a tool for internal management. Sveiby argues that "[...] the measurement's emphasis should be

²⁸⁹The definition of the term "indicator" by Kay Alwert, Manfred Bornemann and Mart Kivikas reads that way: "An indicator is defined as an absolute or relative benchmark which serves to describe a circumstance. The comparability of benchmarks is dependent on them being clearly defined themselves, on their always being calculated in the same way and on an interpretation framework being available (mostly the operative and strategic enterprise goals)." AlBo04, p. 28.

Additionally, Martin Nemetz, who is by now Head of Web Applications at the "Process Competence Center Sales, Service, and Supply" with Hilti (Switzerland), explains that "[i]ndicators are management ratios that describe intangible assets in a number or an interval. An example for indicators would be "training expense per employee" or "share of training hours"." Neme06, p. 220.

adapted to the end user. Management information should emphasize flow, change, and control figures, while external presentations should include key indicators and explanatory text [...]."²⁹⁰ Depending on the chosen purpose the evaluation and its displayed form look different.

The Intangible Assets Monitor consists of a matrix where the three categories of intellectual capital stand in the first row. In the first column, the three perspectives "growth and renewal", "efficiency", and "stability" are inserted. Now for each of these cells one to two indicators should be defined by the management. An example on an Intangible Assets Monitor shows Table 5.1.

Perspective	Competence	Internal Structure	External Structure
Growth and renewal	Number of years in the profession	Investment in information processing systems	Profitability per customer
Efficiency	Proportion of professionals in the company	Sales per support person	Satisfied customer index
Stability	Average age	Rookie ratio	Proportion of big customers

Table 5.1: Example of Sveiby's Indicators of Intangible Assets²⁹¹

As soon as the general outline of the table is completed, actual figures are inserted for each of the indicators. The numbers can now be compared to the data of earlier dates of the same company, because "[a]s in all measurement systems, it is the comparisons that are interesting. A measurement tells nothing at all unless it is compared against a yardstick of some kind: another company, a previous year, or a budget, for example.", Sveiby declares.²⁹² As the selected indicators will be quite subjective in most cases, it will hardly be possible to match them with the ones of other enterprises'.

5.1.5.2 Intellectual Capital Navigator

The Intellectual Capital Navigator was developed by Thomas A. Stewart²⁹³ and released in 1997. It uses the general classification of intellectual capital in human, structural and

²⁹⁰Svei97, p. 164.

²⁹¹Cf. Andr04a, Table A.1, p. 320.

²⁹²Svei97, p. 164.

²⁹³Stew97, pp. 243-246.

customer capital. Basically, the Intellectual Capital Navigator compares current and aspired values of a company's intellectual capital as well as its "Market-to-Book Ratio"²⁹⁴ to realize its current position.

At the beginning of the valuation, individual indicators for the three types of intellectual capital have to be found. For their determination, Stewart established three principles: first, to choose only three measures for each of the perspectives to prevent too much complexity, and an overall indicator to allow for a good overview of the value of intellectual capital as a whole; secondly, the measures have to be defined according to the company's beforehand identified strategy; and thirdly, only those activities, namely only those intangible assets, should be considered which actually create intellectual wealth.

As soon as the indicators are determined, a radar chart is set up, which displays Figure 5.2. Each of the lines therein corresponds to one measure, with appropriate scales (e.g. financial figures or percentages) plotted along them. The target numbers are inserted where the lines cross the circle, the worst possible values are put into the centre. Then the current data for the indicators are taken and the lines are marked accordingly. These points are connected with each other so that an irregular polygon is formed. Now, it can be clearly seen how the company's current status is: what the polygon encloses is the value the enterprise could already gain. The area outside it comprises the objectives the company still strives to achieve.

This radar chart could be quite useful when comparing the organization's current status with one of the past to see whether it moves forward regarding their strategy and previously defined objectives. It could as well be applied for matching one enterprises' situation with a competitor's or the industry's.

5.1.5.3 CompanyIQ

This calculation method was developed by the advertising agency Bates Gruppen, which is based in Norway and part of the globally operating communications group Bates Worldwide. They also tried to trademark CompanyIQ²⁹⁶ in the United States in 1998. This concept basically comprises three steps.

First of all, the management identifies those attributes they believe to give their company a competitive edge and are the most crucial ones for their success. This list of up to twelve

²⁹⁴The Market-to-Book Ratio is illustrated in section 5.1.1.2 of this thesis.

²⁹⁵Cf. Stew97, p. 245.

²⁹⁶Cf. Stew03, p. 300.

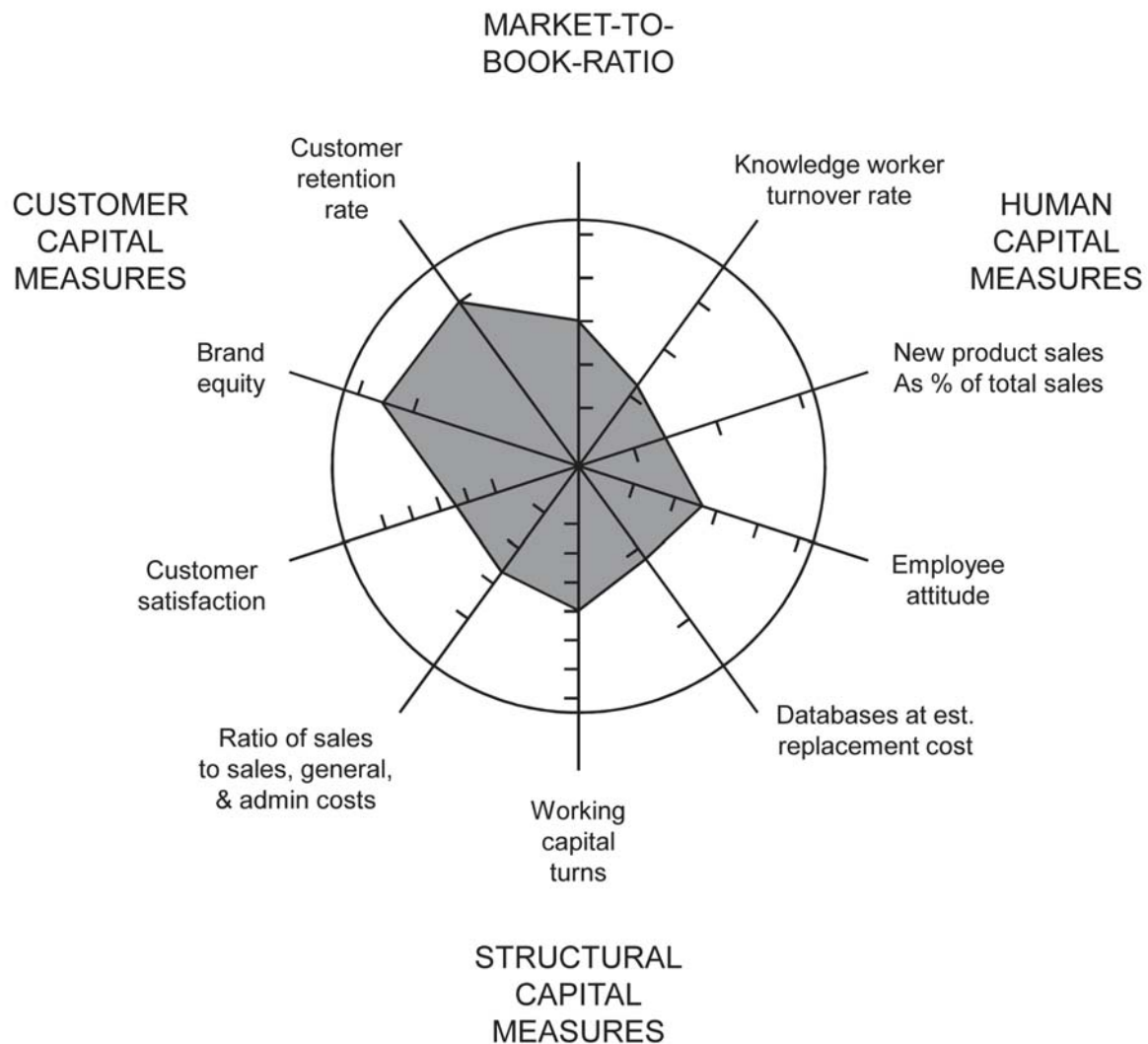


Figure 5.2: Intellectual Capital Navigator²⁹⁵

capabilities is then distributed to the firm's staff and customers in the form of a questionnaire to be evaluated (i.e. rated on a scale from 1 to 7) how unique and valuable they assess them to be for the firm's clients. The attributes are then inserted in a diagram – Figure 5.3 shows this –, where those that the management, the employees as well as the customers regard as the most important ones are found in the upper-right quadrant.

For Bates Gruppen, those identified capabilities of the company refers to its intellectual capital, so the second step that follows now is to determine those intangibles that account for these highly valuable attributes. As an aid a general list of possible intangible assets, grouped in human, relationship and customer capital, is provided for the management to choose the appropriate resources from. On the one hand, the selected assets have to show a strong relation to the previously found crucial attributes of the company. On the

²⁹⁷Cf. Stew03, p. 300.

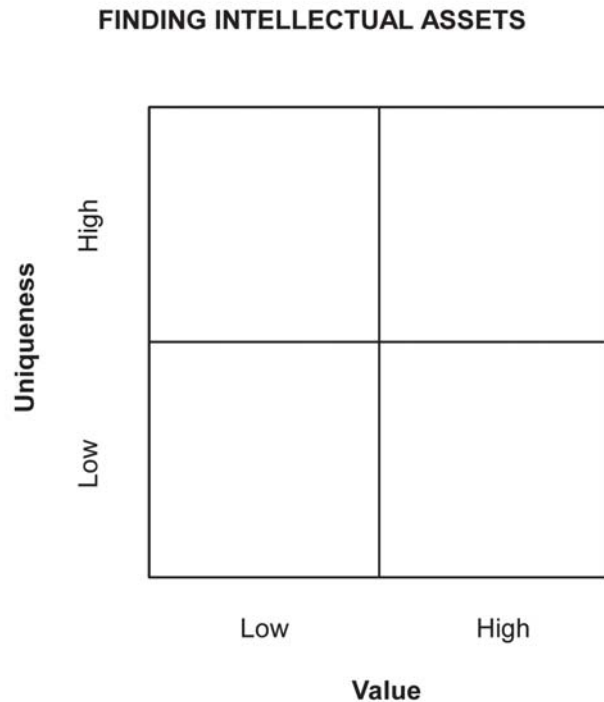


Figure 5.3: Finding Intellectual assets for the CompanyIQ²⁹⁷

other hand, they have to be measurable as well as comparable (at least 60 per cent of them) to respectable benchmarking studies or the public so-called PIMS (Profit Impact Market Strategy) Database. As soon as the intangible assets are identified and a value (a definite number or a number on a scale from 1 to 5) has been put onto them, they can be matched with their competitors' data from the PIMS Database. This directly leads to the main objective of the CompanyIQ: to match the intangible assets and their value of one business with those of their competitors. Taking all the measurements of these enterprises into account, the median CompanyIQ can be calculated, which equals 100. Organizations which show a value greater than that are better off than the average, while the ones with a lower number are worse off.

Thirdly and finally, the calculated CompanyIQ can serve as a trigger for an in-depth analysis of the enterprises' status and its intellectual capital, hence actions for correction or further advancement can also be taken.

5.1.5.4 IC Rating

Besides the well-known Skandia Navigator²⁹⁸, Leif Edvinsson designed the IC (Intellectual Capital) Rating in his Swedish company "Intellectual Capital Sweden"²⁹⁹, specialized in exactly this field of business.

For conducting an IC Rating, five perspectives of intellectual capital are looked upon: the human, organizational and relationship capital individually, the intangibles as a whole, and at a so-called "business recipe" which stands for the organization's business strategy and environment it operates in. These aspects of intangibles are rated on the three levels "efficiency", "renewal", and "risk". Hence, Leif Edvinsson says the following concerning the approach of his model: "IC rating is about benchmarking the perspectives of efficiency, renewal and risks on IC components, for future earnings potential."³⁰⁰ Basis for a further assessment of these facets are data taken out of interviews with the firm's employees, customers, suppliers, and other stakeholders.

The IC Rating is rather easily realizable for a company and allows for matches with competitors due to its standardized rating approach. On the other hand, its outcome strongly correlates to the quality of the designed questionnaire and the validity of given answers of the firm's stakeholders.

An advancement of the IC Rating is the IC Multiplier which is the ratio of structural capital to human capital, so

$$IC\ Multiplier = Structural\ Capital / Human\ Capital$$

If it shows a value above 1 the company was able to bond the human capital in the organization, but if it's below 1 the HC is endangered for flowing out of the firm. So the IC Multiplier can be seen as an indicator for the efficiency of an organization's intellectual capital management.

5.1.5.5 Core-Competence Valuation

The "Core-Competence Valuation"³⁰¹ was drafted in 1999 in the Netherlands by some analysts of KPMG. It is a measurement for the evaluation of so-called "core competences".

²⁹⁸Section 5.1.6.3 of this thesis gives more details on this approach on measuring intellectual capital.

²⁹⁹The website of this company can be found under www.intellectualcapital.se, Access: 2012-06-15.

³⁰⁰Edvi03, p. 14.

³⁰¹Cf. AnFr99.

According to the definition of KPMG's analysts a core competence is more or less an intangible/knowledge asset with strategic importance for the company. The calculation of each core competence is based on the following formula:

$$\text{Core Competence} = \text{Added value} \times \text{Competitiveness} \times \text{Potential} \times \text{Sustainability} \times \text{Robustness}$$

KPMG's valuation classifies intellectual capital into five categories: "Technology & Explicit Knowledge", "Competencies & Implicit Knowledge", "Culture & Values", "Management processes" and "Assets & Endowments" (e.g. client relations or image). Ultimately, the result for one knowledge asset can be compared with its outcome of previous investigations, or one core competence is matched with another to see their significant value in relation to each other.

5.1.5.6 Intellectual Capital Benchmarking System (ICBS)

The Intellectual Capital Benchmarking System³⁰² is a value assessment method developed in the year 2000 by José María Viedma Marti, Spanish pioneer in the area of intellectual capital and its benchmarking and Professor of Business Administration at the UPC³⁰³ Polytechnic University of Catalonia (Spain). Viedma uses the traditional differentiation of intellectual capital into human, structural and relationship capital.

This method strives to benchmark a company in comparison to its biggest competitor. For doing this Viedma designed a general model for assessing a company's business excellence. This general model is elaborated more precisely for each of the firm's business units. Moreover, questions are posed to check which of the models' attributes apply to the organization and how it performs at these criteria in comparison to its competitor. The answers to these questions are also rated according their accuracy. All this information is gathered and consolidated in the form of a balance sheet. Therein the assets show all the characteristics at which the enterprise performs better than its competitor, while the liabilities comprise the attributes the competing company is superior to the assessed firm. Finally, the assets and liabilities are taken to compute a weighted average to benchmark the companies' operational processes.

³⁰²Cf. ViMa00.

³⁰³UPC is the "Universitat Politècnica de Catalunya", which means in English "Polytechnic University of Catalonia".

5.1.6 Holistic Perspective

After introducing some examples for non-monetary indicator based models, a couple of approaches regarding a holistic perspective are explained in the following. The models utilizing a holistic perspective are basically built up similar to the non-monetary indicator based models. In contrast to those, the approaches considering a holistic perspective calculate and assess the intellectual capital using non-financial as well as financial measures. Models which consider a holistic perspective and are explained in the following pages comprise the Balanced Scorecard, the Human Resources Scorecard, the Skandia Navigator, the Human Capital Monitor, the Intangibles Scoreboard, the Value Chain Blueprint, the Holistic Value Approach, the Intellectual Capital Dynamic Value, and the Human Resource Accounting.

5.1.6.1 Balanced Scorecard (BSC)

The Balanced Scorecard, first published in 1992, was designed by the US American economists Robert S. Kaplan and David P. Norton. It is probably the best-known approach on calculating a company's intellectual capital. Kaplan and Norton both are university professors at the Harvard Business School (United States) and work together at Palladium consulting which was founded by the latter one. The BSC was designed for supporting short-term as well as long-run controlling, and can so be used as a management system at the operative, the tactic or even the strategic level. It is a rather plain instrument for the relatively fast measuring of a firm's performance. Kaplan and Norton describe the functioning of their method in this way: "The Balanced Scorecard translates an organization's mission and strategy into a comprehensive set of performance measures that provides the framework for a strategic measurement and management system. [...] The BSC enables to track financial results while simultaneously monitoring progress in building the capabilities and acquiring the intangible assets they need for future growth."³⁰⁴

It comprises four perspectives to allow a company-wide and balanced measurement, presented in Figure 5.4: the financial, the customer, the business processes, and the learning and growth perspective. While the financial perspective focuses on data from annual reports and information about the earnings position of the enterprise, the customer perspective works with facts regarding the company's market position (e.g. market share in certain segments) as well as with information about their customers (e.g. their satisfaction

³⁰⁴KaNo96, p. 2.

or retention, and the reputation of the enterprise among them). The business processes perspective deals with the characteristics of internal core processes; most important here are the processes related to innovation, operations and after-sales service. Finally, the learning and growth perspective handles the so-called soft factors related to the employees of the company. This would be, for instance, their qualifications, motivation and goal-orientation, but also the enterprises' overall organization and information systems, and access to external information. When remembering the classification of intellectual capital, we can relate here the customer perspective with the relationship capital, the business processes one with structural capital, and the learning and growth perspective with the human capital. The financial focus then completes the framework of the Balanced Scorecard.

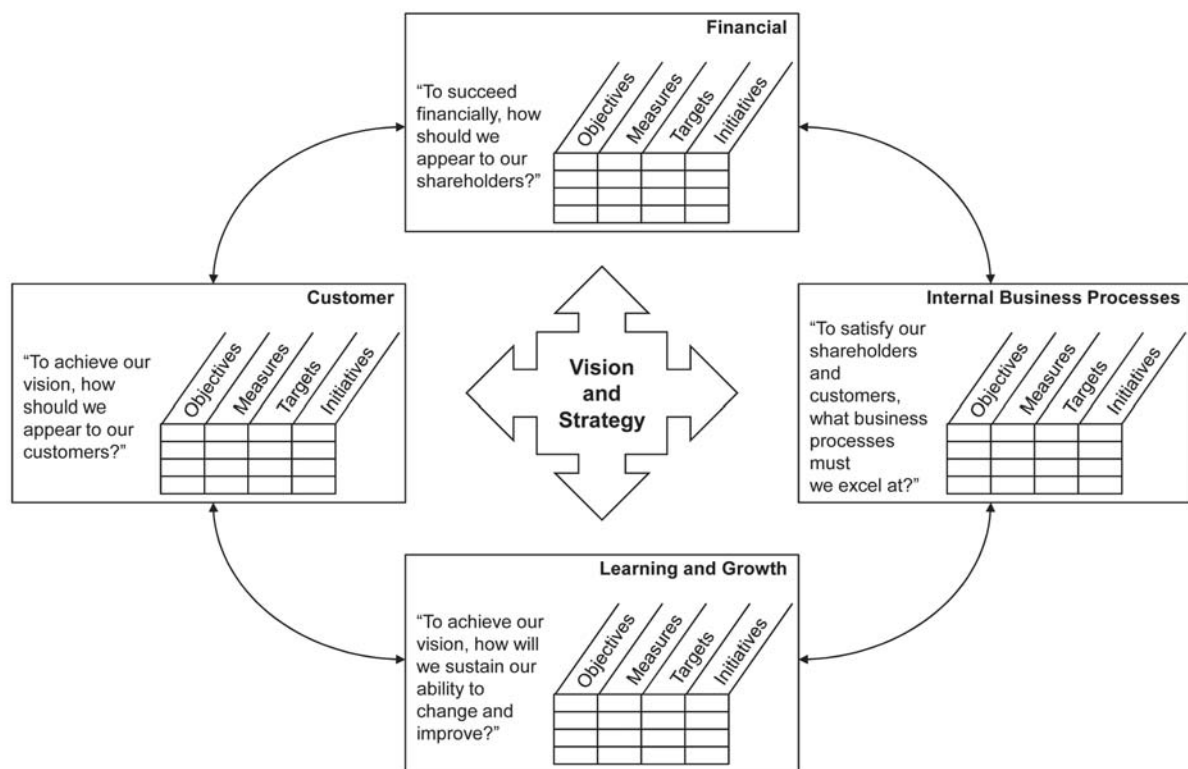


Figure 5.4: The framework for the Balanced Scorecard³⁰⁵

After the determination of the company's overall vision and strategy these are transformed into more precise objectives, definite targets and necessary initiatives for the BSC and its four perspectives. Then, indicators which allow for a measurement of these perspectives are defined for all four of them. These measures are crucial for the whole assessment and limited to a number of 20 to 25 to prevent too much complexity. This also helps in keeping the Balanced Scorecard transparent and clearly focused on the firm's objectives. The cho-

³⁰⁵Cf. KaNo96, p. 9.

sen indicators have to be the most decisive ones regarding the strategy of the according perspective. Moreover, they should comprise external (shareholders- and customers-oriented) as well as internal measures (e.g. with a focus on business processes) and should be generated of past performance data as well as assumed future trends. This directly leads to the reason for naming the scorecard "balanced". Kaplan and Norton strived for a measurement method which focuses on diverse aspects and levels of a company and its determinants which for the designers were most clearly expressed with this denomination: "The name reflected the balance provided between short- and long-term objectives, between financial and nonfinancial measures, between lagging and leading indicators, and between external and internal performance perspectives."³⁰⁶

While generating the BSC a scorecard is designed with which the organization's performance can be assessed. To make the actual position of the enterprise regarding the previously defined goals better visible a strategy map is employed. This additive tool orientates itself again on the four above named perspectives and uses them in the form of layers. With the help of the strategy map the company's essential intangible assets are aligned to the learning and growth perspective. Then the intellectual capital can be used by means of internal processes to achieve some additional customer value which is afterwards transferred into positive financial results.

Besides the strategy³⁰⁷ map, strategic themes which allow for more detailed descriptions and possible actions concerning cause-and-effect relationships (based on the intangible assets) could be introduced as well. In this context, correlations are important to see what effect one taken action regarding a specific indicator has on another measure.

The (graphic) results of the BSC, the strategy map and the strategic themes can quite easily be communicated throughout the enterprise, which may also make future control and decision making much more facile. Concluding, Kaplan and Norton assert that "[t]he real power of the Balanced Scorecard [...] occurs when it is transformed from a measurement system to a management system."³⁰⁸ So "[t]he Balanced Scorecard should be used as a communication, informing, and learning system, not a controlling system."³⁰⁹

Another concept, the "Tableau de Bord" from 1932 is considered as the predecessor of

³⁰⁶KaNo96, p. viii.

³⁰⁷For Kaplan and Norton, "[a] strategy is a set of hypotheses about cause and effect." KaNo96, p. 30.

³⁰⁸KaNo96, p. 19.

³⁰⁹KaNo96, p. 25.

the Balanced Scorecard and – like the name implies – is in wide use in France. As the BSC from Kaplan and Norton is much better known and in wider use than this method, it is not considered further in this thesis.

5.1.6.2 Human Resources (HR) Scorecard

While the Tableau de Bord can be seen as a forerunner of the Balanced Scorecard, the Human Resources Scorecard is a product of further development of the BSC. It was released in 2001 and designed by Brian E. Becker, Professor of Organization and Human Resources with the School of Management of the State University of New York at Buffalo (USA³¹⁰), Mark A. Huselid, who is Professor of HR Strategy with the School of Management and Labor Relations at Rutgers University at New Brunswick, New Jersey (USA), and Dave Ulrich, Professor of Business with the Ross School of Business at the University of Michigan (USA).

The designers suggest using five categories to measure: the workforce success, the right HR costs, the right types of alignment, the right HR practices, and the right HR professionals. Their interdependences are shown in the exemplary Human Resources Scorecard of Figure 5.5. Subsequently, objectives, measures, targets, and initiatives have to be found for each of them.

Ultimately, the HR Scorecard serves for improving a company's workforce strategy, supporting HR managers. As Becker, Huselid and Ulrich argue: "An HR Scorecard lets you do two important things: (1) manage HR as a strategic asset and (2) demonstrate HR's contribution to your firm's financial success."³¹² Other arguments in favour of working with the Human Resources Scorecard are that "[i]t enables you to control costs and create value [...]"³¹³ and that "[i]t encourages flexibility and change [...]"³¹⁴ within the organization, its developers state. As sequel to this approach, Mark A. Huselid and Brian E. Becker, together with Richard W. Beatty, colleague of Huselid at Rutgers University and Professor of Human Resources Management there, developed the Workforce Scorecard which is used for enhancing a firm's overall strategy.³¹⁵

³¹⁰USA are the "United States of America".

³¹¹Adapted from HuBe05, Figure 4-6: Big Pharma HR Scorecard, p. 128.

³¹²BeHu01, p. 53.

³¹³BeHu01, p. 75.

³¹⁴BeHu01, p. 76.

³¹⁵For extensive information on the Workforce Scorecard HuBe05 can be consulted.

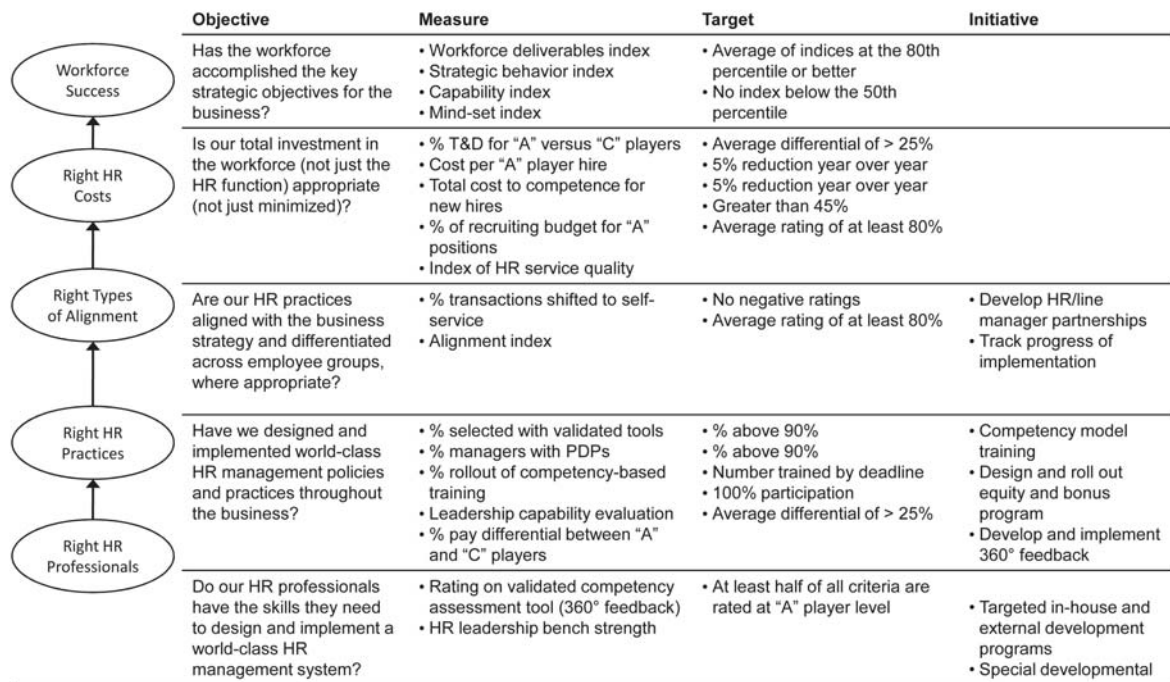


Figure 5.5: Example of a Human Resources Scorecard³¹¹

5.1.6.3 Skandia Navigator

This measurement method was designed by the Swede Leif Edvinsson, Professor of Intellectual Capital at Lund University (Sweden) and Michael S. Malone, an American author of various books on business and technologic issues. It was elaborated at the Swedish insurance group Skandia, which employed Edvinsson as the first Corporate Director of Intellectual Capital worldwide. In 1994 this "Business Navigator" was prepared for the first time and in 1995 made public as the world's first intellectual capital statement, precisely as addition to the company's annual report.

The Skandia Navigator comprises five perspectives: the financial focus, a customer aspect, a process perspective, a renewal and development aspect, and a human focus. Figure 5.6 gives an example of the Skandia Navigator for one of Skandia's business units. These five focuses are arranged in the form of a house which symbolizes the investigated company, and where the human focus and its value is its centre. Three of the perspectives relate to the types of intellectual capital: the customer aspect equalizes the relationship capital, the process focus the structural capital, and the human aspect the human capital. This approach sounds quite similar to the Balanced Scorecard, but while the BSC only includes historical financial data, the Skandia Navigator takes accounting data from the past (in the financial perspective) as well as future trends (in the renewal and development focus) into

consideration. Finally, the customer, the human, and the process aspects regard present concerns.

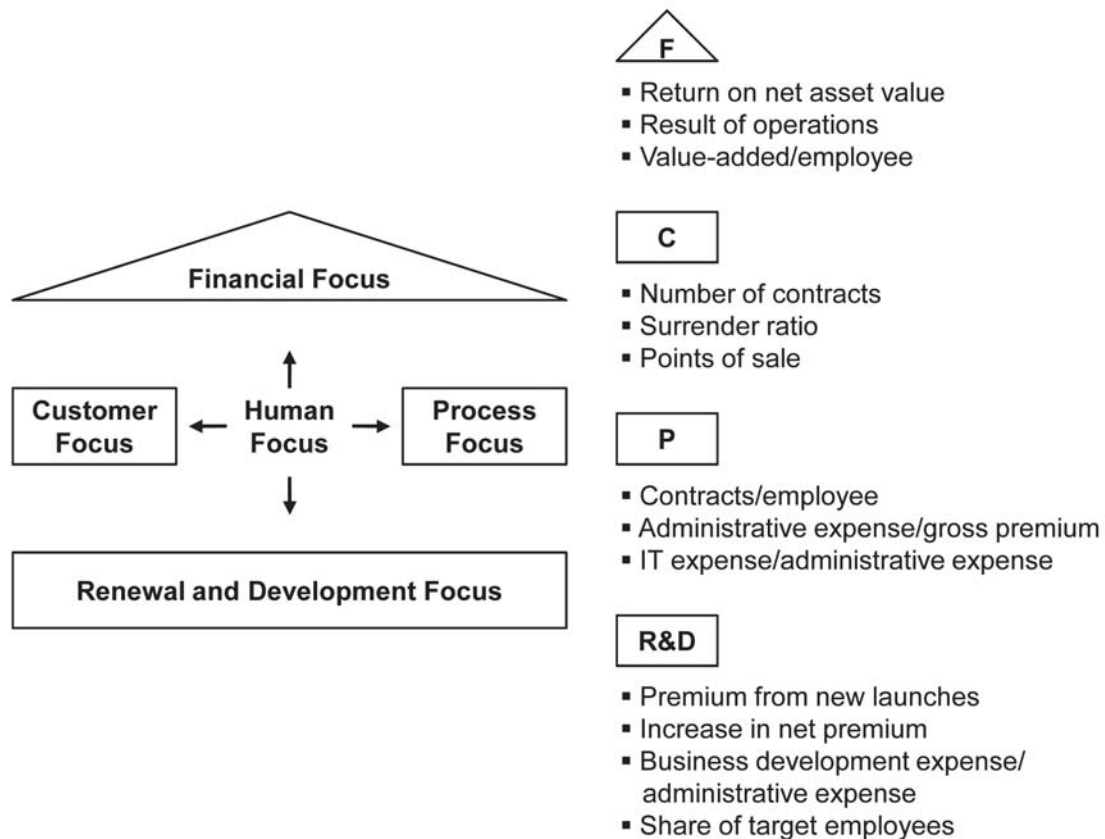


Figure 5.6: The Skandia Navigator³¹⁶

Like in the Balanced Scorecard, indicators are determined for each of the perspectives which are all linked to the previously defined strategy of the company. Edvinsson and Malone suggest finding three to four indicators for each focus, so 15 to 20 measures in total. Some examples for these indicators are as well listed in Figure 5.6.

The financial perspective regards historical and present financial values of the firm, taken from the annual report and other written down-material. For the customer focus furthermore internal statistical data for customer type, customer loyalty, customer role, customer support, and customer retention are used. Concerning the process perspective technology-related indices are taken into consideration. The renewal and development focus moreover looks at indicators based on future and changes inside the company which could be linked to the customers, market attractiveness, the firm's products and services, strategic partners, infrastructure, or employees. Finally, the human focus utilizes data connected to the

³¹⁶Cf. KaNo96, p. 212. Note by the author: The primary source was not available so a secondary one is provided instead.

staff, like its motivation, training, and costs. So here the past (financial focus), the present (customer, human, and process focus) as well as the future (renewal and development focus) are considered for assessment.

As a conclusion of the listing and measuring of all identified indicators, Edvinsson and Brünig agglomerate relationship, human and organizational capital to get the company value which they see as a result of the interplay between the three forms of intangibles.

5.1.6.4 Human Capital Monitor (HCM)

The Human Capital Monitor, as displayed in Figure 5.7, from Andrew Mayo focuses on the human capital of a company. This approach is also named "Human Asset Worth" which refers to the model's approach: namely, that human capital is regarded as a company asset, not as a cost factor.

For measuring its value in a firm, Mayo introduced three pillars in his model: "People as assets", "People motivation and commitment" in connection with the work environment, and "People contribution to added value" for each stakeholder. Andrew Mayo describes the idea behind this arrangement in the following way: "People loan their human capital to us, and we provide an environment in which they can contribute value to stakeholders in our organization."³¹⁷

In the first column, the value of the staff is determined by calculating the so-called "Human Asset Worth" of each individual, using a specific formula. This takes into account the costs and worth of each employee. In this context, their core activities for maximizing human capital, which would be the acquisition, the retention, and the growth (the development via training, et cetera) have always to be kept in mind. For the second pillar indicators for assessing the effectiveness of the working environment of and around the staff have to be found and rated. Finally, the third column "People contribution to added value" looks at the value each employee contributes, precisely if their specific influence means a current or future profit or loss for the stakeholders of the company (i.e. its shareholders, its parent companies, its customers, its employees, its suppliers, the public, the government, and its community/environment). For all these three columns measures at the four levels "the enterprise", "the organizational units", "the teams", and "individuals" are picked.

The chosen indicators are all weighted as being either on the asset or on the liability side

³¹⁷Mayo03, p. 11.

³¹⁸Cf. Mayo03, p. 12.

PEOPLE AS ASSETS		PEOPLE MOTIVATION AND COMMITMENT		PEOPLE CONTRIBUTION TO ADDED VALUE		
Human Asset Worth = employment costs x individual asset multiplier (IAM) / 1000 IAM = a function of • capability • potential • contribution • values alignment Maximizing Human Capital <table><tr><td> • Acquisition • Retention • Growth </td><td> - How successful are we? - What drives success? </td></tr></table>	• Acquisition • Retention • Growth	- How successful are we? - What drives success?	+	Measures - How successful are we? The work environment that drives success • Leadership • Practical support • The workgroup • Learning and development • Rewards and recognition	=	The value added to each stakeholder • financial • nonfinancial • current • future
• Acquisition • Retention • Growth	- How successful are we? - What drives success?					

Figure 5.7: The Human Capital Monitor³¹⁸

of the intellectual capital balance sheet, as Andrew Mayo calls it. This balance sheet works similar to the classical one, where assets do mean the indicator succeeds a target value and liabilities are measures which fall below this aim. All of these assets and liabilities are looked upon to deduce whether a single indicator does mean a current or future value for the company, its business goals and stakeholders. Concluding, it is said that an intellectual capital measurement with the help of the Human Capital Monitor is rather time-consuming.

5.1.6.5 Intangibles Scoreboard

The Intangibles Scoreboard, formerly known as the "Knowledge Capital Scoreboard", was developed by Baruch Lev, Professor of Accounting and Finance with the Stern School of Business at New York University, and released in 1999. The financial consultant classifies intellectual capital unlike the common differentiation, namely in innovation-related, human resource, and organizational intangible assets. Daniel Andriessen explains that "Lev has developed both a top-down approach (the intangibles scorecard) and a bottom-up approach (the value chain scoreboard ...)." ³¹⁹ The latter is discussed in section 5.1.6.6 Value Chain Blueprint of this thesis.

The objective for applying the Intangibles Scoreboard is for Lev to see what economic ef-

³¹⁹ Andr04a, p. 323.

fects investments in intellectual capital have. It is considered as a rather complex calculation method. In his computation, which he elaborated together with Feng Gu, Assistant Professor of Accounting and Law with the School of Management at the University of Buffalo (United States), Lev distinguishes between tangible, financial, and intangible resources. Their generated earnings are crucial for the valuation of the intellectual capital for which Lev and Gu consider publicly available past as well as future data. First, the company's earnings of the last three and forecasted next three years are taken and "estimated average annual earnings" are calculated. Following this, the expected rates of return on tangible and financial assets are computed, using their current values and average return rates for both. Afterwards, these computed expected rates of return are deducted from the previously calculated "estimated average annual earnings" to get the so-called IDE, the "intangibles driven earnings". The IDE are then forecasted from the next year on till infinity, using financial models and analyst's estimation of future growth rates. Finally, these forecasted intangibles driven earnings are discounted, considering their intrinsic high risk, to get their present value, which equals the value of the intellectual capital.

The IDE as well as the value of the intangibles may now also be utilized for calculating new useful and promising financial ratios. All these figures can be compared either with past data from the same company or with the whole industry.

5.1.6.6 Value Chain Blueprint

This measurement method, also known as the Value Chain Scoreboard, was designed in 2001 by Baruch Lev, just as the Intangibles Scoreboard as already mentioned above. Its denomination refers to the importance of the value chain within an organization which stands for the business model of the very same. For Lev, this value chain contains business relevant information and is necessary for the development and innovation in and of any company. It comprises three stages which have to be passed through: the "discovery and learning" phase, and the steps of "implementation", and finally "commercialization". When someone wants to draft a Value Chain Blueprint they have to find and select indicators for these three stages, broken down to three levels each. Table 5.2 gives an overview of these as well as possible measures for each of them. The Value Chain Blueprint serves as assessment method both for internal and external purposes.

³²⁰Adapted from LevB01, p. 111.

Discovery and learning	Implementation	Commercialization
1. Internal renewal • Research and development • Work force training and development • Organizational Capital, processes	4. Intellectual property • Patents, trademarks, and copyright • Licensing agreements • Coded know-how	7. Customers • Marketing alliances • Brand values • Customer churn and value • Online Sales
2. Acquired capabilities • Technology purchase • Spillover utilization • Capital expenditures	5. Technological feasibility • Clinical tests, Food and Drug Administration approvals • Beta tests, working pilots • First mover	8. Performance • Revenues, earnings, and market share • Innovation revenues • Patent and know-how royalties • Knowledge earnings and assets
3. Networking • R&D alliances and joint ventures • Supplier and customer integration • Communities of practice	6. Internet • Threshold traffic • Online purchases • Major Internet alliances	9. Growth prospects • Product pipeline and launch dates • Expected efficiencies and savings • Planned initiatives • Expected breakeven / cash burn rate

Table 5.2: The Value Chain Scoreboard³²⁰

5.1.6.7 Holistic Value Approach (HVA)

The Holistic Value Approach, published in the year 1997, was developed by Göran Roos, expert in the field of intellectual capital and founder of the British strategy consulting firm Intellectual Capital Services. It is based on his earlier designed IC Index and the IVM (Inclusive Value Management) by Philip M'Pherson's. The HVA aims for an intellectual capital assessment by jointly using a financial valuation and an intangibles' navigator. Moreover, this approach uses the classic differentiation of intellectual capital into the three pillars.

When applying the Holistic Value Approach as displayed in Figure 5.8 first of all the stakeholders of the regarded company have to be identified. In this context, their strategic intent has to be figured out. On the one hand, this involves discovering the stakeholders' objectives, which are then expanded into measurable attributes. On the other hand, the objective weights have to be detected, and the attribute characteristics have to be obtained. Afterwards, the stage called "strategic alignment" follows, where the previously determined objectives of the firm's stakeholders are translated into measurable indicators. Therefore, the defined attributes – the indicators – are related to the so-called value creation path of the organization. Crucial here is to find the "real company value creation path" which influences the strategic alignment as well as the following "measurement" step of the approach. The

strategic alignment is done by introducing a navigator like in Figure 5.9 which shows the value creation within the business. This graphic shows the firm's resources and their importance to the stakeholders (i.e. the bigger the circle the more relevant the asset), as well as the so-called value-creating paths between them. In the navigator, these paths are shown as arrows which are drawn between resources and the ones they can be transformed into. This view on the assets and the value-creating paths serves as a control mechanism to see if the way of how value really is created in the company matches its strategy of value creation.

The arrows, namely the paths, within this navigator are connected to the previously intro-

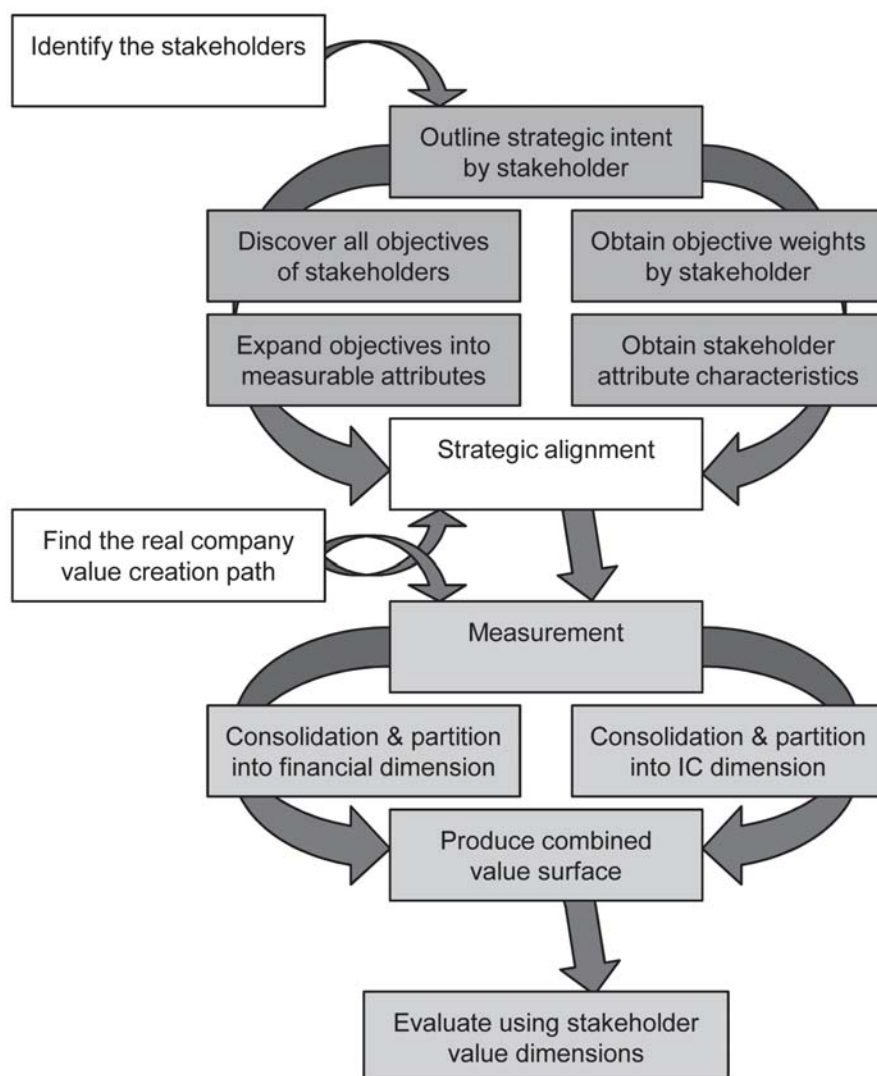


Figure 5.8: The HVA approach³²¹

duced indicators. Afterwards, the measurement of these indicators follows which involves their consolidation and partition into a financial as well as an IC dimension. These indicators

³²¹Cf. PiRo00, p.11, Figure 4.

are those tangible and intangible assets which seem to be crucial for achieving the defined goals. The intangibles are separated from the tangible assets to allow appropriate measurement. While the tangible, financial resources are simply assessed using mathematics, the calculation of intellectual capital needs additional time and effort. All of the intangibles get two numbers assigned which represent the lowest and the highest value the asset may have to attain the predefined objective. The figures are then standardized so the target values of all resources are between 0 and 1, where the former means the goal could not be achieved at all and the latter signifies that the target has been met by 100 per cent. As now the intangibles have the same scale, they can be combined and measured.

The output of conducting all of the above are two combination models and two combined intangible values – one each for the intangible and the tangible assets. Ultimately, the aim of the measurement is to generate a combined value surface, which is evaluated using the stakeholders' value dimensions. This means identifying the contribution of intangible assets to the value of the business, their stakeholders, and others. Concluding, the HVA serves as a management tool for transforming strategy into actions and to verify if these are effective. Additionally, it is useful for informing the company's shareholders of the value of their resources.³²².

5.1.6.8 Intellectual Capital Dynamic Value (IC-dVal)

This framework for valuing intangibles was created in 2002 by Ahmed Bounfour, who is Professor on Intellectual Capital Management at the University Paris-Sud (France). It is named this way to point out the dynamic of the process of assessing and managing the intellectual capital.

In contrast to the up-to-now renowned differentiation of intangible assets into the three pillars, Bounfour classifies intellectual capital into four groups: structural, human, market, and innovation capital. While the description for the first two equalizes the classical definition of them, and market capital is quite similar to relationship capital, innovation capital is implemented as a new independent component, by which the potential for innovation of the assessed company is meant. Furthermore, Bounfour introduces four perspectives on which his valuation and management is performed: an input, an output, an internal-managerial,

³²²Cf. PiRo00.

³²³Cf. Andr04a, p. 299. Note by the author: The primary source was not available so a secondary one is provided instead.

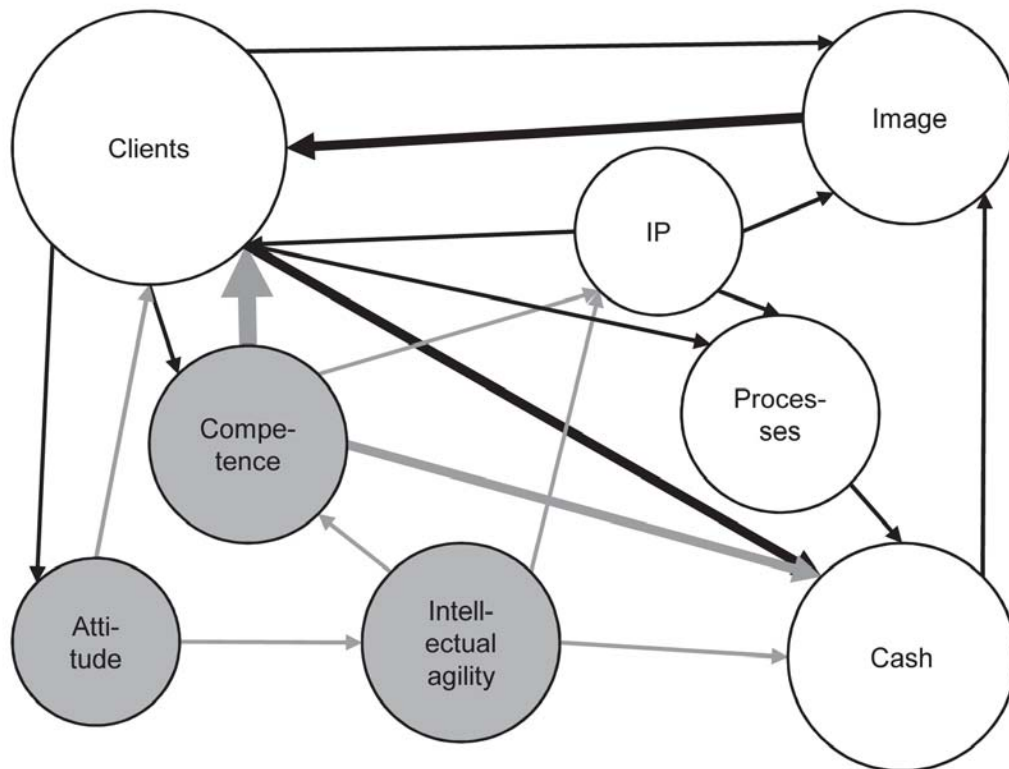


Figure 5.9: Roos' navigator³²³

as well as an external focus. These aspects directly lead to the objective of the IC-dVal: to connect internal and external perspectives and inputs and outputs.

For conducting the Intellectual Capital Dynamic Value approach an index of performance is calculated by determining performance indicators on the levels resources, processes, and outputs, and then adding these up. The Dynamic Value then finally is the multiplication of the performance index times the company's market value.³²⁴

5.1.6.9 Human Resource Accounting (HRA)

The Human Resource Accounting comes from the United States of America and is very popular in India these days. First basic approaches on HRA date already back to the Middle Ages, while it only became an academic subject in the 1960s. As its name reveals, the HRA focuses on the measurement of human capital and does not take into account structural and customer capital. It provides information concerning the value and the costs of the asset "staff". Therefore, it serves as aid in taking or improving management decisions in this sphere as well as helps an enterprise towards an employee-orientation. The results

³²⁴Cf. Boun03.

of this method can also be presented to investors and shareholders.

In distinction to the other approaches on calculating intellectual capital explained above, the Human Resource Accounting is not a measurement method. It rather comprises various valuation models for assessing the value of human capital. The first examples classed among this group of approaches were published in the 1960s and 1970s.

There exist special calculations for the input side of the Human Resource Accounting, namely the Human Cost Accounting, and others for the output perspective, the Human Value Accounting.³²⁵

Up to now, various approaches on measuring intellectual capital have been illustrated. The next task stage 1 of the process explained above handles the introduction of several approaches on intellectual capital reporting.³²⁶

5.2 Approaches on Intellectual Capital Reporting

Nowadays, enormous amounts of money are spent on generating and publishing financial reports, which is a multiple of that expended for intellectual capital statements. What is just as true is that in traditional annual and financial reports (including the balance sheet or the profit and loss statement), intellectual capital is hardly considered, and if it is, it is not considered properly. Jeffrey A. Cohen³²⁷ tolerantly refers to that when saying that "[m]any of these assets [by which he means intellectual property, like patents, copyrights or customer lists] show up on firms' financial statements. But firms might possess another kind of intangible asset, one that is harder to classify and value [...], [e.g.] long-established customers, or exclusive supplier agreements, an experienced and loyal workforce, a great location, or a chief operating officer with superlative organizational skills."³²⁸

The reason for intellectual capital being not presented or not presented accurately in common reports is that these statements arose in the industrial era and focus mostly on monetary aspects and tangible assets. In this context, Robert S. Kaplan and David P. Norton argue: "This venerable financial accounting model is still being used by information age companies as they attempt to build internal assets and capabilities, and to forge linkages

³²⁵Cf. CPT11.

³²⁶This thesis' approach and an explanation of the process underlying it can be found in section 3.2 of this thesis.

³²⁷Cf. Cohe05.

³²⁸Cohe05, p. 1.

and strategic alliances with external parties."³²⁹ They assume that including intangibles in a financial report would make it easier to communicate their worthiness to shareholders, employees, and other interested parties. Additionally, Kaplan and Norton mention that this is difficult to achieve as a definite financial value cannot be determined for the intangibles of a company. In addition to this, for Edvinsson and Brünig "[t]he existing control instruments of management predominantly rely on quantitative measures and disregard qualitative elements."³³⁰

So only including intellectual assets in a basically financially based report would probably not reflect them appropriately. Moreover, as Thomas A. Stewart puts it: "Accounting's failure to disclose intellectual capital is not just a theoretical problem. It costs investors money [...]. At the very least it reduces prosperity by distorting flows of investment capital, which should go where it can be most productively employed."³³¹ Additionally, for instance "R&D (which produces structural capital), high-performance work systems (which produce human capital), and brand equity (a measure of customer capital) all produce significant gains in the value of companies. Investors and managers ought to know about them, but accounting rules mandate that much of the information remain hidden."³³²

On the other hand, Jürgen H. Daum³³³ argues that just due to the introduction of new international accounting principles, companies and analysts will be more focused on the intangible assets. As a result, he argues, more standards for intellectual capital reporting are necessary and will be implemented, as well as internal controlling mechanisms to be able to monitor and report on the intangibles. These accounts on the intangible assets of a company should then enhance the traditional financial report to form a new business analysis.

So, a statement separately from the financial report – an intellectual capital statement – is desirable to present all important aspects of a company of which intellectual capital is of course a part. There the reasons for a nondisclosure in classical reports – often due to difficulties in measuring and evaluating the intellectual assets – could more easily be overcome.

There exists a growing number of methods for preparing an intellectual capital statement.

³²⁹KaNo96, p. 7.

³³⁰German original, translated by the author; cf. EdBr00, pp. 22-23: "Die vorhandenen Kontrollinstrumente des Managements beruhen vorwiegend auf quantitativen Größen und vernachlässigen qualitative Elemente."

³³¹Stew03, p. 272.

³³²Stew03, p. 277.

³³³Cf. Daum02.

Moreover, since 2002, for instance, it is even obligatory in Denmark to publish such a statement as supplement to the annual report. Many of these approaches on intellectual capital reporting include estimated numbers for company data or are simply experiments of assessments, but it shows that the importance of reporting on the intellectual assets of a company increases, mainly to allow for making accurate investment decisions. In these intellectual capital reports it is crucial to find appropriate indicators and methods for measurement in order to adequately show the value of a company's intellectual assets.

These benefits derived from compiling an intellectual capital statement are named by Kay Alwert, Manfred Bornemann and Mart Kivikas³³⁴, namely:

- "systematic management of the organisation,
- acquisition of loan and equity capital,
- meeting legal requirements,
- employee recruitment and retention,
- developing cooperation, and
- customer acquisition and retention."

The approaches on intellectual capital reporting which are considered for further analysis in this thesis are the Danish "Guideline for Intellectual Capital Statements", the ARC-Wissensbilanz, the "Human Capital Profit and Loss Statement", the "Intellectual Capital Statement – Made in Germany", the "Intellectual Capital Report Benchmarking", and the "Wissensbilanz-Verordnung 2010".

5.2.1 Danish "Guideline for Intellectual Capital Statements"

The Danish guideline was released in 2000 by the "Danish Agency for Trade and Industry" of the "Ministry of Trade and Industry". The motivation for publishing this document was "[...] to improve the framework of conditions for business in the new circumstances" [introduced by the "knowledge economy"]³³⁵. Background behind this was a research project, carried out by the government of Denmark from 1998 to 2002. It was supported by 17 Danish companies who participated in this venture.

³³⁴ AlBo04, p. 12.

³³⁵ DATI00, p. 5.

In this context, intellectual capital was not divided into the classical three but instead into four groups: the "employees" (which represent human capital) including the experience, competencies and motivation of the staff. The "customers" comprise the relationship to clients, containing their loyalty and a focus on their demand, besides others. Furthermore, the "processes" refer to the ones related to the firm's knowledge, for instance control and innovation processes. Finally, the "technologies" back up the other three classes, thereby also considering the in-place IT systems like the intranet.

The Danish guideline has incorporated an assessment of the company's knowledge management. This comprises the four components of "knowledge narrative", "knowledge management challenges", "initiatives", as well as "indicators". The first element focuses on the company's objectives regarding their customers, namely the opportunities to further strengthen and increase the value the clients ascribe to the firms' products and/or services, named as "use value". In this context, it is assessed how intellectual capital contributes to the characteristics of these. Secondly, "knowledge management challenges" deals with the question of "which of the organization's intellectual assets how to improve?". The third component introduces a set of "initiatives", which are "actions" for generating, developing and acquiring knowledge resources, plus for reviewing their impacts and for reaching the firms' objectives. Fourthly, a set of "indicators" allows tracking the initiatives' success and controlling if the firms' targets have been attained. Examples for such measures would be the "percentage of university graduates of all personnel" or the "number of recent assignments of patents". Finally, an intellectual capital report is compiled where all obtained results are brought together.³³⁶

5.2.2 ARC–Wissensbilanz

The ARC-Wissensbilanz³³⁷ is a method developed within the former Austrian Research Centers in Seibersdorf and published in 2000. Besides, in 2009 the ARC were renamed "Austrian Institute of Technology" (AIT). At the time of its release the ARC-Wissensbilanz was meant as being implemented in research institutions. Its objective, moreover, was to enhance the communication with external stakeholders as well as improve the universities' control abilities on intellectual capital. Its approach and underlying process model is displayed in Figure 5.10.

³³⁶Cf. Nort11, pp. 243-244.

³³⁷The English translation of this term would be "Intellectual Capital Report of the Austrian Research Centers".

The intellectual capital report of the ARC classifies intellectual capital according to the well-

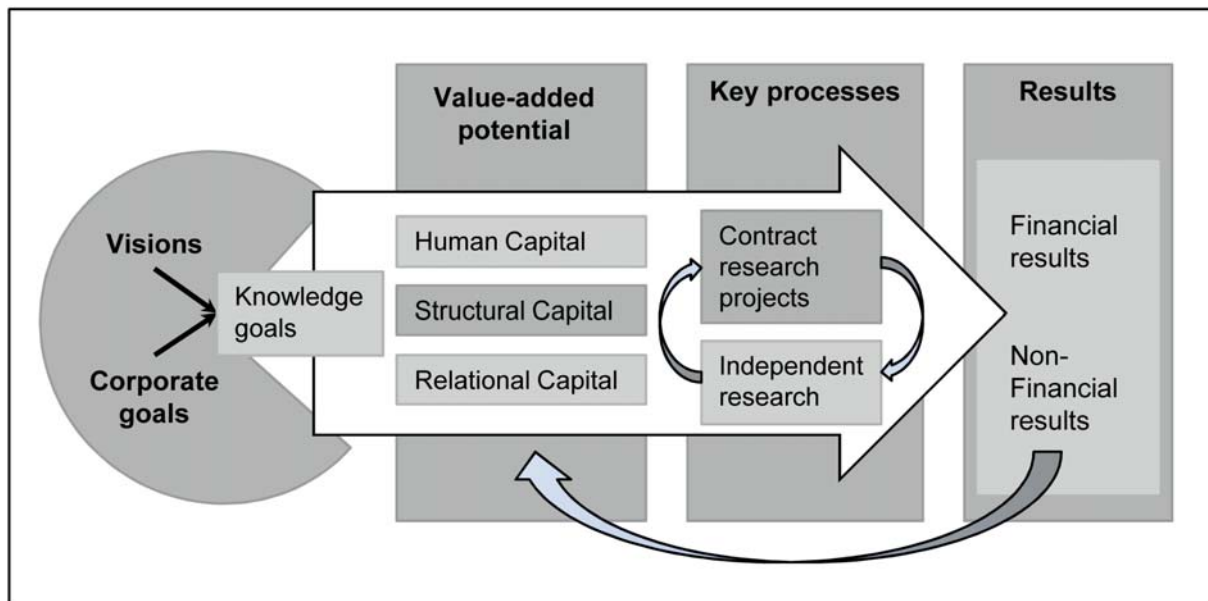


Figure 5.10: The ARC IC Reporting Model³³⁸

known three groups of human, structural, and relationship capital. Starting point in this model are the visions and corporate goals of the organization, which define and have influence on the so-called "knowledge goals". These explain the influence of intellectual capital on the organization's key processes and give information on how the intangibles should develop or be developed. The key processes themselves comprise mainly contract research projects and independent research. Additionally, the components of intellectual capital contain value-added potential, so they are a source of value creation for the organization. All classes of intangibles (hence, human, structural, and relationship capital) have to be incorporated into the key processes to demonstrate their significance for these. This as well allows gaining non-monetary results for the intellectual capital report, besides financial outcomes. Furthermore, the key processes and the single parts of intellectual capital are determined by indicators, which are themselves selected on basis of and defined by the knowledge goals.

Finally, the overall image of the ARC Intellectual Capital Reporting model also gives an overview of the flow of knowledge within the organization. Moreover, it shows knowledge as input, which would be the intellectual capital, as well as output, namely the results received by creating an intellectual capital report. An example on the ARC-Wissensbilanz is attached to the Appendix A of this thesis. The AIT makes their latest intellectual capital

³³⁸Cf. Koch03, s. 10.

statement available for download on their website³³⁹.

5.2.3 Human Capital Profit and Loss Statement

This method of reporting was designed by Jac Fitz-enz, founder of the Saratoga Institute – now a subsidiary of PwC, which offers human resources services – and well-known author of many books and articles on Human Resources Benchmarking and Performance Measurement. It is based on the traditional financial profit and loss (or income) statement. Its objective furthermore is to show the contribution of human capital to the company's earnings, and hence calculate the value of these assets.

The "Human Capital Profit and Loss Statement" takes the revenue of the company concerning human capital and subtracts from this the direct expenses for acquiring, maintaining and developing its employees. Then the indirect expenses, like vacancy and training costs of staff, are subtracted to get the net income on human capital, as displayed in Table 5.3.

REVENUE		
Human capital value added	\$2665	<i>Revenue less nonhuman expenses</i>
DIRECT EXPENSES		
Acquiring	15	<i>Cost of hiring</i>
Maintaining	1128	<i>Pay and benefit cost</i>
Developing	12	<i>Cost of training</i>
GROSS INCOME	1510	
INDIRECT EXPENSES		
Vacancy costs	126	<i>Revenue lost for, say, jobs unfilled</i>
Learning curve	438	<i>Revenue lost for partial productivity during first year of employment</i>
NET INCOME	946	

Table 5.3: A Human Capital Income Statement (from Fitz-Enz)³⁴⁰

This approach of reporting human capital gives a good overview of the cost of a firm's

³³⁹The website address of the AIT's intellectual capital statement is <http://www.ait.ac.at/presse/wissensbilanz/>, Access: 2012-05-30.

³⁴⁰Cf. Mayo03, p. 138.

employees in comparison to their value, although some critics argue that the numbers used in such a "Human Capital Profit and Loss Statement" will never be a hundred per cent definite.

5.2.4 Intellectual Capital Statement – Made in Germany

This method and the as well published reporting software, called the "Wissensbilanz-Toolbox", were released in 2004 by the German Federal Ministry of Economics and Labour, especially designed for the implementation in SMBs. "The ability to make the best possible use of both internal and external knowledge is vital to small and medium-sized enterprises. The intellectual capital statement (or report) offers a strong foundation for this, providing the means to achieve a comprehensive inventory and evaluation of an enterprise's intangible assets."³⁴¹ This is the introductory sentence to the written guideline for implementing an "IC statement – Made in Germany" and likewise illustrates the motivation for its development. The method provides two models: one as guidance for preparing an intellectual capital report and another one for the design of the statement itself.

The diagram regarding the first objective of the "Intellectual Capital Statement – Made in Germany" is displayed in Figure 5.11. It starts with assessing the initial situation, possibilities and risks which are in place in the commercial environment. Based on this the vision and the strategy of the organization are identified and defined. These lead to measures which support the accomplishing of the firm's objectives. The measures regard the intellectual resources of the company, namely the human, structural, and relationship capital. In this context, the model also shows the interdependencies between the resources, here called "knowledge processes". These interact with the business processes, which are again influenced by the organization's resources. The output of the business and knowledge processes plus all resources (so besides human, structural, and relationship capital also financial resources, for instance) lead to business success. The achieved results support the improvement of the firm's objectives, vision and strategy.

The line of action for realizing an intellectual capital statement with the help of the Wissensbilanz-Toolbox consists of eight steps. This sequence starts with a description of the initial situation of the company, and covers furthermore an evaluation of the intellectual capital present, a definition of indicators for a measurement of said intangibles, and the compilation

³⁴¹ AlBo04, p. 3.

³⁴² Cf. AlBo04, p. 15, Fig. 1 and Nort11, p. 241, Abbildung 6-6; German original, translated by the author.

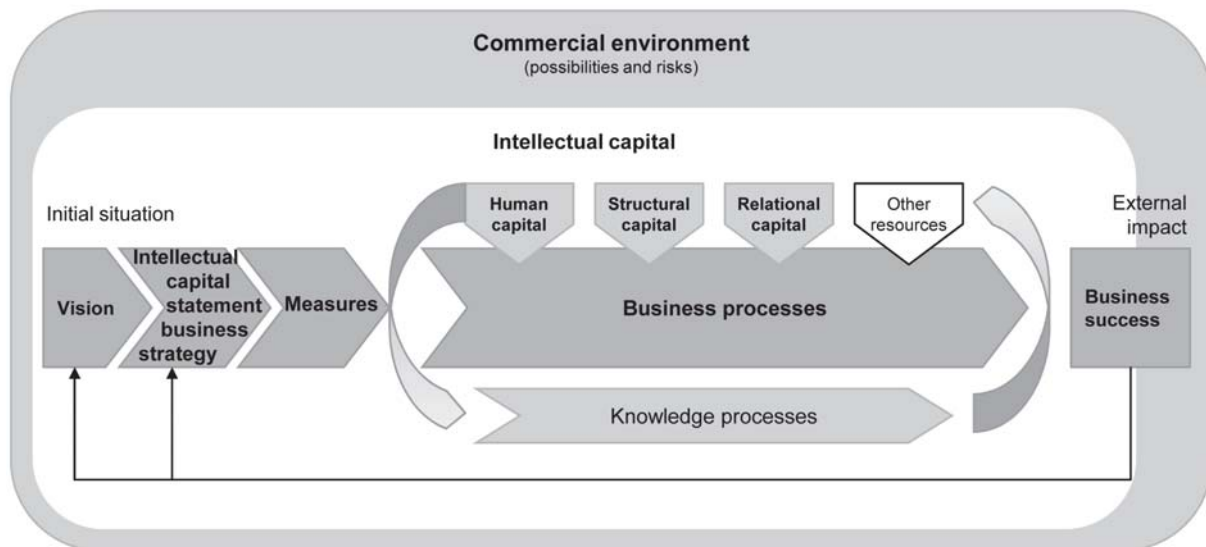


Figure 5.11: The intellectual capital statement model developed by the Intellectual Capital Statement Project Group (AK-WB)³⁴²

of the intellectual capital report itself. Figure 5.12 delivers more details on this procedure. Concerning this project planning it is crucial for the authors Jutta Rump and Gaby Wilms that the tool offers flexible acting within a solid frame.³⁴⁴ Step 1 regarding the initial situation of the business requires decisions on its vision and strategy. In this context, a focus is given on the business processes of the company to figure out the knowledge goals of said firm. Then, step 2 looks at the influencing factors³⁴⁵ of human, structural, and relationship capital separately. Afterwards an assessment of the intellectual capital is carried out in step 3 to learn how the factors of influence affect the operational business as well as its strategic orientation. This leads to an analysis of strengths and weaknesses of the factors. Moreover, step 4 asks for defining some indicators for each of the influencing factors to be able to measure changes. Furthermore, there exist interdependencies between the factors of influence, which have to be recognized and appraised by means of a sensitivity analysis in step 5. In step 6 the relationships between and impacts from one on the other influencing factors are graphically displayed – using a so-called interdependency network³⁴⁶ – to be able to identify then the development potential. Step 7 now allows for building up a plan

³⁴³Cf. RuWi07, p. 13, Abbildung 4; German original, translated by the author.

³⁴⁴Cf. RuWi07, p. 14.

³⁴⁵Kay Alwert, Manfred Bornemann and Mart Kivikas give the following explanation regarding "influencing factors": "In the event of changes, influencing factors affect business success and the organisation's achievement of its goals. They can also relate to tangible (such as plant and machinery), financial (for instance loan and equity capital flows) and intangible assets (such as employee skills and organisational culture)." AIBo04, p. 22.

³⁴⁶"An interdependency network is the graphical portrayal of the links between influencing factors in an organisation. It permits the visual identification of interactive dependencies." AIBo04, p. 22, Kay Alwert, Manfred Bornemann and Mart Kivikas explain.



Figure 5.12: Structured line of action for generating an Intellectual Capital Report³⁴³

of action, based on the findings from the preceded steps. Finally, in step 8 the intellectual capital report is compiled, whose appearance and content are adapted depending if it will be used for internal or external communication.

Summarizing, Kay Alwert, Manfred Bornemann and Mart Kivikas argue in favour of implementing the IC report because for them "[...] the intellectual capital statement is on the one hand a tool for the systematic development of strategy and of the organisation. It makes it possible to targetedly manage projects and initiatives internally so as to improve intellectual capital management. On the other hand, it can be used for external communication in order for instance to acquire funding for future investments."³⁴⁷ That implies that "[i]f an enterprise is able to make its intellectual capital transparent on the financial market in such a form, it becomes easier to take up loans, and funding costs for innovative and risk-prone investments will be reduced."³⁴⁸

³⁴⁷ AlBo04, p. 8.

³⁴⁸ AlBo04, pp. 8-9.

5.2.5 Intellectual Capital Report Benchmarking (ICRB)

This approach was developed at the Department of Knowledge Engineering of the University of Vienna, according to the principles of meta modelling, whereas a meta model is basically the model of a model. The Intellectual Capital Report Benchmarking is not a single method for the measuring and reporting of intangibles but rather a framework which allows the incorporation of any measuring and/or reporting approach from above, as well as others not listed in this thesis. This basically means that the ICRB allows the implementation of an intellectual capital management and reporting without the limitation of having to choose one single model for the intangibles' measurement. Hence, the ICRB works with meta modelling to allow the implementation of this idea.

The Intellectual Capital Report Benchmarking comprises the following six steps: first of all, it asks for defining the company's strategy as a foundation for the intellectual capital statement. Based on this, the organization's business processes and working environments have to be drawn in the second stage. Afterwards, these activities have to be filtered out which involve intellectual capital – i.e. human, structural, or customer capital. In the fourth step, these activities have to be modelled using the concept of meta modelling. The ICRB introduces this approach to achieve benchmarks which are applicable to various intellectual capital management and reporting models as well as are comparable among one another. Additionally, not only the knowledge-intensive activities but also the according indicators are subject to a transformation into benchmarks. Finally, step six of the ICRB includes an analysis of the whole undergone process. This is done by looking at the derived intellectual capital statement and validating its indicators' results.

The Intellectual Capital Report Benchmarking does not only provide a framework for undertaking this process but also the technical infrastructure to implement it in practice.³⁴⁹

5.2.6 Wissensbilanz-Verordnung 2010 (WBV 2010)

The Austrian "Wissensbilanz-Verordnung 2010" was released by the "Austrian Federal Ministry of Science and Research" and applies to all Austrian universities. Actually, the long title of the latest version from 2010, as amended on May 24th, 2012 is named "Verordnung der Bundesministerin für Wissenschaft und Forschung über die Wissensbilanz"³⁵⁰. Its purpose

³⁴⁹Cf. Neme06.

³⁵⁰Translated into English Wissensbilanz-Verordnung means "Regulation on the Intellectual Capital Statement"; its long title would be "Regulation of the Federal Secretary of Science and Research on the Intellectual

is explained in §2 WBV 2010, as follows: "The Intellectual Capital Statement serves as holistic presentation, assessment and communication of the university's intangible assets and performance processes and their impacts. It is used as a qualitative and quantitative foundation for building a performance agreement as well as for re-enacting the realization of objectives and projects of the performance agreement."³⁵¹

Hence, according to the WBV 2010, an intellectual capital statement comprises on the one hand a descriptive part about various topics concerning the university, for instance about the strategy, the organisation, the quality management or the co-operations. In addition, it involves corresponding ratios regarding the classifications of intellectual capital – i.e. human, relationship, and structural capital – and certain core processes and outputs/impacts. The WBV 2010 describes and defines these ratios in high detail. On the other hand, it includes a report on the realization of previously declared aims; this statement has to be designed according to the guidelines in the WBV 2010.

Finally, the ratios and their evaluation have to be submitted to the Federal Ministry of Science and Research. The intellectual capital report itself has to be published in the newsletter of the university within it was compiled.³⁵²

All in this thesis regarded regulations on compliance as well as approaches on intellectual capital measuring and reporting have been introduced and explained by now. The next subject to bring into focus is the one of small and medium-sized businesses.

Capital Statement". Primarily, the WBV 2010 was published as the "Regulation of the Federal Ministry for Education, Science and Culture on the Intellectual Capital Statement".

Besides, the Austrian "Federal Ministry of Education, Science and Culture" was separated in the year 2007 into two ministries: the "Federal Ministry of Education, Arts and Culture" and the "Federal Ministry of Science and Research"; the latter is now responsible for releasing the Wissensbilanz-Verordnung.

³⁵¹German original, translated by the author; cf. RIS12, §2: "Die Wissensbilanz dient der ganzheitlichen Darstellung, Bewertung und Kommunikation von immateriellen Vermögenswerten und Leistungsprozessen der Universität und deren Wirkungen. Sie ist als qualitative und quantitative Grundlage für die Erstellung der Leistungsvereinbarung sowie für den Nachvollzug der Umsetzung der Ziele und Vorhaben der Leistungsvereinbarung heranzuziehen."

³⁵²Cf. RIS12.

Chapter 6

The Intellectual Capital of Small and Medium-sized Businesses

As this thesis focuses on the intellectual capital and compliance management for small and medium-sized enterprises, the special characteristics of these kinds of businesses have to be regarded.

General attributes which determine companies comprise, for instance, their legal form, their line of commerce, the number of their employees company-wide, the number of their locations, or financial amounts like their total revenue per year. "There is no single globally accepted definition of SME. [...] However, definitions typically require SMEs to be independent firms, and also are typically based on firm size limits according to the number of full-time employees. In addition, definitions of SME sometimes include thresholds of firm financial performance, such as the value of annual sales, annual revenue, or turnover (total revenue minus indirect taxes)."³⁵³ This is what the "United States International Trade Commission" writes about the definition of an SMB.

As already mentioned above, the "IFRS for SMEs", for instance, define a small and medium-sized enterprise without the mentioning of limits. Therein, an SMB is a business that does for one not have public accountability and furthermore releases financial reports for external purposes. The second point refers to the publishing of company data, as an instrument of informing their investors and other stakeholders about business activities.

An overview of the various definitions naming boundary values for the definition of an SME existent all over the world is given in Table 6.1, here in the context of their exporting activities. Numbers here are all converted to US dollars as the spreadsheet is borrowed from the

³⁵³USITC10, pp. 2-1-2-2.

Country or Region					
Region	Definition				
United States		All manufacturing firms and non-exporting service firms*	Exporting service firms**		Farms
			Most	High value	
	Number of employees	< 500	< 500	< 500	< 500
	Annual revenue	Not applicable	≤ \$7 million	≤ \$25 million	≤ \$250,000
European Union					
	Number of employees		< 250		
	Annual turnover		≤ €50 million (\$61 million)		
	OR				
	Balance sheet total		≤ €43 million (\$52 million)		
Australia					
	SME (nonfarm)				
	Number of employees		≤ 200 employees		
	SME (farm)				
	Estimated value of operations		A\$22,500–A\$400,000 (\$18,866–\$335,400)		
Canada					
	Number of employees		< 250		
	Annual revenue		< C\$50 million (\$48 million)		

* Includes exporting and non-exporting manufacturing firms and nonexporting service firms.

** Selected by the Commission on the basis of size and export potential, and includes wholesale trade services; professional, scientific, and technical services; and finance and insurance services.

Table 6.1: SME Definitions in the United States, the European Union, Australia, and Canada³⁵⁴

The European Commission, for example, released an own recommendation concerning the characteristics defining small and medium-sized enterprises³⁵⁵. Therein in Article 2, an SMB is declared as an enterprise with

- less than 250 employees and
- an annual turnover of less than or equal to 50 million euros and/or

³⁵⁴Cf. USITC10, p. 2-3.

³⁵⁵Cf. CEC03a

- an annual balance sheet total of less than or equal to 43 million euros;

whereas a small enterprise is furthermore an organization with

- less than 50 employees and
- an annual turnover and/or annual balance sheet total of less than or equal to 10 million euros.

Firms which meet above named criteria can declare themselves before the European Union as being a small or medium-sized enterprise and can then benefit from less rigorous regulatory EU compliance.

BASEL II and III moreover define an SMB as a company which

- employs less than 500 people and
- whose annual sales are below 50 million euros.

Furthermore, due to the nature of small and medium-sized businesses, they find themselves in another, special situation concerning intellectual capital management and reporting in comparison to other organizational forms. One vital point to start with is that many of the SMEs are managed by their owner(s).

Jutta Rump and Gaby Wilms name more specific challenges present in SMBs³⁵⁶: first, in these organizations there is often no department for knowledge and/or intellectual capital management in place, due to the size of the company and therefore its limited financial and personnel resources. Second, hierarchies there are flatter and the communication between employees or divisions passes much faster and more flexible than in large companies. Third, the individual and their specific knowledge have much more importance to the SME than on the average rate, and the replacement of employees is much more time-consuming and cost-intensive.³⁵⁷

Additionally to the above named circumstances present in small and medium-sized enterprises, Klaus North argues as follows: among others, the organization's (expert) knowledge is in many cases linked with single employees and is hardly made explicit by documenting

³⁵⁶Rump and Wilms name these challenges in connection with knowledge management, but the author presumes this to be as well applicable to intellectual capital management as the latter stands in close connection with the former.

³⁵⁷Cf. RuWi07, pp. 7-8.

it. Moreover, SMBs have less financial resources available in comparison to multinationals, which often connotes for them worse access to credits, or at least worse conditions when they are being granted one. On the contrary, North states that having implemented a "knowledge base" – and in this context also intellectual capital management and reporting – allows companies a better access to their knowledge and hence improve their decision making. This knowledge about their knowledge also enables SMEs to reinforce their uniqueness and strengths.³⁵⁸

Reasons why small and medium-sized businesses should be especially motivated to implement intellectual capital reporting in their organization are pointed out by Sören Lange and Stephan Kraemer from the consultancy Bearing Point. Precisely, they name these risks: the higher chance of losing senior staff, crucial customers or suppliers; the non-existent (strong) brand as safeguard in troubled times; and the limited financial resources.³⁵⁹ Consequently, as Kay Alwert, Manfred Bornemann and Mart Kivikas argue, "[...] in contrast to multinational groups, in most cases small and medium-sized enterprises (SMEs) cannot circumvent domestic cost pressures by quickly relocating abroad."³⁶⁰

Summarizing, there does not exist the one global definition for what an SME is. Moreover, there exist various challenges for these kinds of businesses instead which have to be kept in mind.

³⁵⁸Cf. Nort11, pp. 212-213.

³⁵⁹Cf. KeNe09, p. 451.

³⁶⁰AlBo04, p. 7.

Chapter 7

Comparison of Regulations and Approaches

Now, only one essential part of stage 1 of this thesis' process³⁶¹ is left to elaborate: the comparison of regulations on compliance and approaches on intellectual capital measuring and reporting.

As already noted in the course of explaining this thesis' approach, the in force regulations and directives on compliance as well as the methods on measuring and reporting intellectual capital are analyzed, precisely in terms of relevancy for SMBs. The following approach aims to spot and select the fundamental criteria for setting up a control system for the implementation of intellectual capital management and reporting as well as compliance management in small and medium-sized businesses. At first, the regulations on compliance are evaluated.

7.1 Assessment of Regulations on Compliance

This assessment involved all of the fifteen above introduced regulations. For this purpose, Tables 7.1, 7.2 and 7.3 have been designed which lists all these guidelines on compliance and furthermore ten chosen classes of characteristics. These categories comprise:

- the regulation's region of origin,
- its effective date,
- if and when an update of the regulation was released or is planned,

³⁶¹More information on this process and the overall approach of this thesis can be found in section 3.2.

- the kind of regulation,
- its degree of obligation,
- its main objective,
- its main target businesses
- and main target countries, as well as
- the kind of publisher and
- a description of its publisher.

Table 7.1 shows the comparison of the models' characteristics of "region of origin", "effective date", "update", "kind of regulation", and "obligation". Here, the majority of analyzed regulations, namely six out of the fifteen, were developed in the United States of America, these including also the non-obligatory frameworks COSO and COBIT. At least three of the guidelines and laws are based in the European Union; numbering its single member states among it, they amount to eight of fifteen regulations. So, the efforts in enhancing the parameters defining and influencing the economic world are equally present in the United States of America as well as in the European Union. Only the development of frameworks on compliance like COSO and COBIT seems to be more common in independent US entities than in European ones.

Concerning their effective dates moreover, almost all of the regulations were put into force in the 1990s or from 2000 onward. This can be ascribed to the various company scandals involving accounting fraud as well as to the global financial crisis, both depicted already in the introduction to this thesis. Eleven out of fifteen regulations were or are planned to be effective or updated within a decade, namely between 2002 and 2014. On about half, precisely eight of the fifteen regulations under investigation, a revised version was published or is under development. This again shows the need for compliance regulations and for the extension of already in-place laws and guidelines.

Furthermore, the kind of regulation has been analyzed, namely if the regulation is a law or rather a directive. Only four of all the regulations are actually laws while nine are directives and two are frameworks. This is closely connected with the degree of compliance the regulations impose. Nearly all of the investigated regulations are basically mostly or

partly obligatory, although only four of them are true laws. Additionally, there are some regulations which are not mandatory by themselves but were made compulsory by being integrated into national laws; this holds true for the IFRS and BASEL II. Merely three are really non-obligatory regulations, namely the OECD principles, and the frameworks COSO and COBIT.

		Region of origin	Effective date	Update	Kind of regulation	Obligation
International Regulations	OECD Principles	France	1999	2004	directive	non-obligatory
	IFRS	UK	2005	-	directive	non-obligatory itself, partly made obligatory by national laws
	BASEL II & III	Switzerland	2007	2013	directive	non-obligatory itself, but mostly made obligatory by national laws
European Regulations	SOLVENCY I & II	EU	1970	planned 2014	directive	mostly obligatory
	MiFID	EU	2007	-	directive	partly obligatory
	EuroSOX	EU	2006	-	directive	partly obligatory
United States' Regulations	SOX	USA	2002	-	law	mostly obligatory
	US GAAP	USA	1930s	regularly	directive	partly obligatory
	HIPAA	USA	1996	-	law	mostly obligatory
	FATCA	USA	2010	planned 2013	law	mostly obligatory
Other National Regulations	Austrian Code of CG	Austria	2002	regularly	directive	mostly obligatory
	KonTraG	Germany	1998	-	law	mostly obligatory
Further Regulations	COSO	USA	1992	2004	framework	non-obligatory
	COBIT	USA	1993	regularly	framework	non-obligatory
	Listing standards of stock exchanges	various	various	?	directive	partly obligatory
		Region of origin	Effective date	Update	Kind of regulation	Obligation

Table 7.1: Comparison of Regulations on Compliance, Part 1

Regarding the main objectives of the various regulations, Table 7.2 has to be referred to. In this context, it is observed that these mostly comprise improvements of certain aspects of the economic world. These include, for instance, the enhancement of tax compliance of foreign financial assets in the case of FATCA, or the general improvement of corporate governance in German businesses, the KonTraG aims at. Besides this main objective, another target concerns the protection of certain groups of participants in the capital market, like the MiFID which strives for better safeguard of consumers in the investment business. Still another purpose of developing a regulation is to give general advice and guidance, like the OECD principles on corporate governance.

A further regarded characteristic regarded are the main target businesses the regulations focus at. They mostly refer to individual business sectors like the financial services sector in case of FATCA and BASEL II & III. One especially interesting aspect hence for the purpose of this thesis concerns the target groups of SOX, US GAAP and the national codices of corporate governance as well as (naturally) the listing standards of stock exchanges: namely that these regulations were primarily developed and put into effect for companies which plan or already have shares listed at a stock exchange. With regard to SMEs it is worthwhile mentioning that due to their limited personnel and financial resources these kinds of businesses did in the past often have to face more problems in getting their shares listed than multinationals. In the meantime, many of today's stock exchanges introduced own segments for the trading of SMBs' shares, so getting admitted to the listed has become much easier for small and medium-sized enterprises.

Another feature of the regulations regards the main target countries they aim at. Only six of these do even limit their area of validity while the majority does not mention a target territory at all. This may serve as proof for the global economy today's businesses are operating in.

		Main objective	Main target businesses	Main target countries
International Regulations	OECD Principles	give advice and propose standards on CG	no limitation	no limitation
	IFRS	create and introduce globally valid accounting standards	EU-based companies	EU members
	BASEL II & III	secure international convergence on revisions to supervisory regulations governing the capital adequacy of internationally active banks	financial services sector	-
European Regulations	SOLVENCY I & II	enhance regulation on insurance	insurance and reinsurance businesses	EU members
	MiFID	better protect consumers in the investment business	investment business	EEA
	EuroSOX	optimize the accuracy of financial reports and prevent future fraud	EU-based companies	EU members
United States' Regulations	SOX	protect investors by improving accuracy and reliability of corporate disclosure	companies with stocks listed at an US stock exchange	-
	US GAAP	provide business information to stakeholders	companies with stocks listed at an US stock exchange	-
	HIPAA	improve the health industry	health industry	USA
	FATCA	improve tax compliance of foreign financial assets	financial services sector	-
Other National Regulations	Austrian Code of CG	give guidance for executives on how to operate good corporate management	companies with stocks listed at Prime Market of VSE	-
	KonTraG	improve CG in German businesses	-	Germany
Further Regulations	COSO	allow companies to match their internal controls and standards	-	-
	COBIT	support businesses' internal control systems	-	-
	Listing standards of stock exchanges	regulate stock exchange and allow orderly trade there	companies with stocks listed at corresponding stock exchange	country where stock exchange is based
		Main objective	Main target businesses	Main target countries

Table 7.2: Comparison of Regulations on Compliance, Part 2

One final characteristic of the in force regulations is analyzed: their kind of publisher, giving a description of them as well. Table 7.3 shows these. Almost all of the regulations were developed on behalf of or in connection with a government or an association like the European Union. Only four of all 15 regulations were more or less independently evolved: the IFRS, the US GAAP, and the frameworks COSO and COBIT. Interesting in this context is the independence of the US GAAP's developer. All partly or mostly obligatory regulations focusing on the European Union, the United States and other nations were designed in some connection with a governmental agency, with the one exception of the US GAAP. This proves the governmental mandate concerning the subject of compliance.

Summarizing, it can be said that none of the above introduced and explained regulations on compliance set requirements which exclude small and medium-sized businesses in general from the obligation to apply it. This implies that none of the regulations can be ruled out from the compliance management for small and medium-sized enterprises.

		Kind of publisher	Description of publisher
International Regulations	OECD Principles	dependent on OECD member states	OECD: an organization with 34 member states worldwide
	IFRS	independent	IASB: independent committee of accounting experts
	BASEL II & III	G10-based committee	Basel Committee on Banking Supervision
European Regulations	SOLVENCY I & II	EU-based	European Commission
	MiFID	EU-based	European Parliament and Council
	EuroSOX	EU-based	European Parliament and Council
United States' Regulations	SOX	US federal agency	US SEC: regulatory authority of the US stock exchange
	US GAAP	independent	FASB: a committee under private law
	HIPAA	legislature of US government	US Congress
	FATCA	US government agency	IRS: Internal Revenue Service of the US federal government
Other National Regulations	Austrian Code of CG	governmental-charged	Austrian CG Workgroup
	KonTraG	governmental-based	German Bundestag: legislative body of German government
Further Regulations	COSO	independent	COSO: private-sector US organization
	COBIT	independent	ISACA: association of experts
	Listing standards of stock exchanges	public company	corresponding stock exchange
		Kind of publisher	Description of publisher

Table 7.3: Comparison of Regulations on Compliance, Part 3

7.2 Evaluation of Methods for Intellectual Capital

Measuring and Reporting

After the analysis of valid regulations on compliance, now the approaches on intangibles' measuring and reporting are evaluated. For a further assessment then those models or features of models on valuing intangibles are considered which seem the most promising regarding feasibility and manageability in practice. Klaus North already did a more general assessment of various intellectual capital measuring and reporting models. For this purpose, he looked at several characteristics on certain levels of said approaches, these are as follows³⁶²:

"Requirements of the models:

- Structure or process orientation
- Degree of standardization/comparability
- Transparency of the approach

Measurements:

- Evaluator
- Target group
- Benchmarks
- Raw data and their validity
- Reproducibility

Assessment:

- Indicators
- Weighting of the results

³⁶²German original, translated by the author; cf. Nort11, pp. 250-253: "Voraussetzungen der Modelle. Struktur- versus Prozessorientierung: [...] Standardisierungsgrad/Vergleichbarkeit: [...] Transparenz des Vorgehens: [...]. Messungen. Beurteiler: [...] Zielgruppe: [...] Bezugsgrößen: [...] Ausgangsdaten und deren Validität: [...] Reproduzierbarkeit [...]. Bewertung. Indikatoren: [...] Gewichtung der Ergebnisse: [...]. Ergebnis. Darstellung von Ursache-Wirkungs-Zusammenhängen: [...] Bezug zu finanziellen Indikatoren: [...] Aussagekraft des Ergebnisses: [...]".

Result:

- Display of cause and effect connections
- Reference to financial indicators
- Meaningfulness of results"

North derives six conclusions from his assessment: firstly, each approach for measuring and reporting intellectual capital has its strengths and weaknesses; hence there is no perfect model yet for this purpose. Secondly, North argues that indicator-based models are to favour when using the intangibles' evaluation internally. He also acknowledges the increased spending on capital and time they imply but argues that they also yield more usable and more objective results. The third finding concerns the reasons for organizations implementing an intellectual measuring and reporting, namely that these cardinally base on marketing effects. Hence, North claims for a realistic assessment of the intellectual capital. Fourthly, he figured out that the majority of organizations utilizing the approaches are small and medium-sized businesses. In this context, North suggests applying the models rather to single units in these enterprises than the whole company. The fifth conclusion cites the handling of internal company data, precisely that the models on managing and reporting intellectual capital do not give information on how to treat this. Sixthly and finally, the status of an IC statement in relation to the annual financial report is not yet certain or even clear defined.³⁶³

Already and only by regarding Klaus North's findings some conclusions can be derived yet. First of all, it has to be said that a comparison of existent methods on intellectual capital measuring and reporting is insofar necessary as the underlying principles and approaches vary – sometimes more, sometimes less – from one model to the other. Moreover, there is not the one perfect model for intellectual capital measuring and reporting: some focus more on a financial valuation, others more on a non-monetary assessment; some are more facile in undertaking but others more comprehensive. The aim of this thesis is to underline the apparent strengths when looking at all in-place methods as a whole, and then bundling these to be integrated in the business rules system.

The analysis of the existing methods on measuring and reporting IC is – as done with the guidelines on compliance – executed by comparing the above introduced thirty models and

³⁶³Cf. Nort11, pp. 254-255.

guidelines in various classes of characteristics. For this purpose all resources already regarded in the introduction to the approaches were looked over again. Basically, the main objectives were stressing similarities and differences of the models in single criteria and identifying the best aspects according their efficiency in implementation. Tables 7.4, 7.5, 7.6 and 7.7 show the results of the methods' assessment.

Possible criteria for consideration are the feasibility of the models in practice, the already present distribution, their reputation among experts and practitioners; at the same time their simplicity in execution but complexity in valuation and results. Furthermore, questions like "does the approach deliver functions or calculations or rather a graphical output?", "does the model support a division- or company-wide assessment?" or "is a comparison between divisions or companies possible"? were regarded. Some of these considerations concerning the models' characteristics can more or less simply be found in the literature on these methods. Other features could be derived by applying logic to the models' approaches. Still other characteristics are quite difficult to identify by solely analyzing these procedures, and detecting them rather goes beyond the scope and possibilities of this thesis. Therefore, only those features are regarded for further analysis which could either be found in the literature on the methods or could be derived by analyzing these. The following twelve characteristics of the models are selected for the comparison of the approaches:

- the model's region of origin,
- its release date,
- the kind of assessment the model provides,
- its main objective,
- its target businesses,
- if the model uses a classification of intellectual capital and if yes what kind of classification,
- if the model uses IC indicators for the assessment,
- the model's degree of comparability if implemented in an organization,
- the model's purpose, namely if it was primarily meant or can be used for internal management and/or external information,

- the kind of outputs it delivers,
- the kind of publisher who released or developed the model and
- a description of this publisher.

First of all, the model's region of origin was under focus. This model feature is displayed in Table 7.4. Half of all the approaches were designed and/or released in the United States of America. Interesting here is that nearly all of the market value oriented, revenue oriented and value added approaches originate in the USA. The majority of non-monetary indicator based models were developed in Northern Europe, namely in Sweden, the Netherlands and Norway. Concerning the holistic perspective of IC measuring approaches, again fifty per cent were evolved in the United States; the other half was developed in Europe. Finally, the considered models on intellectual capital reporting again do mainly come from European developers. Admittedly, half of these were released in Austria as these models were exemplarily selected for this thesis, whereas the precise country of origin is not as crucial for the scope of this comparison as the region.

			Region of origin	Release date	Kind of assessment
IC Measuring Methods	Market Value Oriented Models	Market Value/Book Value Difference	USA	probably mid 20's century	financial
		Market-to-Book Ratio	USA	probably mid 20's century	financial
		Tobin's q	USA	1968	financial
	Revenue Oriented Models	CIV	USA	1997	financial
		Shareholder Value	USA	1986	financial
		Weightless Wealth Tool Kit	The Netherlands	2004	Financial
	Value Added Approaches	EVA	USA	1994	financial
		MVA	USA	1990s	financial
	Non-monetary Indicator Based Models	Intellectual Capital Audit	USA	1996	non-financial
		Intangible Assets Monitor	Sweden	1997	non-financial
		Intellectual Capital Navigator	USA	1997	non-financial
		CompanyIQ	Norway	1998	non-financial
		IC Rating	Sweden	2002	non-financial
		Core-Competence Valuation	The Netherlands	1999	non-financial
		ICBS	Spain	2000	non-financial
			Region of origin	Release date	Kind of assessment

Table 7.4: Comparison of Models on IC Measuring and Reporting, Part 1

Furthermore, the approaches' release date was regarded. While the vast majority was published in the 1990s and 2000s, the market value oriented models are relatively old-established in comparison, being around forty years older than the other methods. The newest approaches were designed in recent years, among these all the models on intellectual capital reporting, for instance the Wissensbilanz-Verordnung in 2010 and the Intellectual Capital Report Benchmarking in 2006.

			Region of origin	Release date	Kind of assessment
IC Measuring Methods	Holistic perspective	BSC	USA	1992	financial & non-financial
		HR Scorecard	USA	2001	financial & non-financial
		Skandia Navigator	Sweden	1994	financial & non-financial
		HCM	UK	2001	financial & non-financial
		Intangibles Scoreboard	USA	1999	financial & non-financial
		Value Chain Blueprint	USA	2001	financial & non-financial
		HVA	UK	1997	financial & non-financial
		IC-dVal	France	2002	financial & non-financial
		HRA	USA	1960s	financial & non-financial
IC Reporting Approaches		Danish "Guideline for Intellectual Capital Statements"	Denmark	2000	financial & non-financial
		ARC-Wissensbilanz	Austria	2000	financial & non-financial
		Human Capital Profit and Loss Statement	USA	around 2000	financial
		IC Statement – Made in Germany	Germany	2004	financial & non-financial
		ICRB	Austria	2006	financial & non-financial
		WBV 2010	Austria	2010	financial & non-financial
			Region of origin	Release date	Kind of assessment

Table 7.4 (continued)

The next characteristic of comparison was the kind of assessment the models provide. To analyze this feature was – beyond research – mostly a matter of applying logic to the denomination of the kind of model. That means that the market value oriented, revenue oriented and value added approaches solely utilize financial valuation. The non-monetary indicator based models in contrast only use non-financial assessment, as well as the Intellectual Capital Audit. In Addition, the holistic models comprise both kinds of evaluation. Indeed interesting was the observation regarding the kind of assessment the approaches on IC reporting support. Except from the "Human Capital Profit and Loss Statement", all methods use financial as well as non-financial assessment.

Moreover, the approaches' main objectives were under focus – as shown in Table 7.5 –, which are quite diverse. Some of the models were especially designed for enabling comparisons, like in case of the CompanyIQ to be able to match the intangible assets and their value of one company to those of their competitors, or the ICBS for benchmarking a firm with its biggest competitor. Another objective of some approaches is the measurement of certain aspects or features of intellectual capital, for instance the Core-Competence Valuation which strives for evaluating exactly these. Furthermore, one aim was to improve the current knowledge management or other aspects of businesses. One example for this would be the Danish "Guideline for Intellectual Statements" which was basically developed for generally improving the conditions for companies in the new knowledge economy. Additionally, the HR Scorecard strives to enhance a firm's workforce strategy. Other objectives found in the analyzed approaches were explained, among others, as wanting to give support or to highlight the importance of intangibles, or aspects of these.

The next feature under consideration regarded the question if the models designers had some target business in mind for which they developed their method. Almost all of the approaches were not intended for some special target group, with a few exceptions. The Weightless Wealth Tool Kit, for instance, clearly names knowledge-intensive companies as their addressed audience. While this objective target can more or less be transferred to all of the other models as well, the ARC-Wissensbilanz clearly aims at research institutions. Similar to this, the WBV 2010's target businesses are (Austrian) universities, while the "IC Statement – Made in Germany" targets SMEs. The last remark is of course especially interesting for the purpose of this thesis.

			Main objective	Target businesses
IC Measuring Methods	Market Value Oriented Models	Market Value/Book Value Difference	compare an organization's book and market values	businesses whose shares are listed at the stock exchange
		Market-to-Book Ratio	compare an organization's book and market values	businesses whose shares are listed at the stock exchange
		Tobin's q	measure the value of the company's IC by taking the market value of the assets and comparing it with their replacement cost	businesses whose shares are listed at the stock exchange
	Revenue Oriented Models	CIV	compare a company's ROA with industry average	-
		Shareholder Value	focus on the company's value for their shareholders and compute if it increased over time	businesses whose shares are listed at the stock exchange
		Weightless Wealth Tool Kit	analyze "core competences", intended for "knowledge-intensive companies" > 50 employees	knowledge-intensive companies
	Value Added Approaches	EVA	measure annual performance and value creation	-
		MVA	measure the economic profit of an organization	-
		Intellectual Capital Audit	audit an organization's intellectual capital	-
	Non-monetary Indicator Based Models	Intangible Assets Monitor	offer a tool for measuring and managing IC	-
		Intellectual Capital Navigator	compare current and aspired values of a company's intellectual capital as well as its Market-to-Book Ratio to realize its current position	-
		CompanyIQ	match the intangible assets and their value of one company to those of their competitors	-
		IC Rating	recognize further revenue potential by benchmarking efficiency, renewal and risk on IC elements	-
		Core-Competence Valuation	evaluate core competences	-
		ICBS	match a company with its biggest competitor	-
			Main objective	Target businesses

Table 7.5: Comparison of Models on IC Measuring and Reporting, Part 2

			Main objective	Target businesses
IC Measuring Methods	Holistic perspective	BSC	support controlling, can so be used as a management system	-
		HR Scorecard	improve a company's workforce strategy	-
		Skandia Navigator	design a "business navigator" as addition to the annual report	-
		HCM	regard human capital as a company asset and evaluate it accordingly	-
		Intangibles Scoreboard	see what economic effects investments in intellectual capital have	-
		Value Chain Blueprint	highlight the importance of an organization's value chain for information purposes	-
		HVA	aims for an IC assessment by jointly using a financial valuation and an intangibles' navigator	-
		IC-dVal	connect internal and external perspectives	-
		HRA	support taking or improving management decisions concerning staff	-
	IC Reporting Approaches	Danish "Guideline for Intellectual Capital Statements"	improve the conditions for companies in the new knowledge economy	-
		ARC-Wissensbilanz	enhance the communication with external stakeholders as well as improve the universities' control abilities on IC	research institutions
		Human Capital Profit and Loss Statement	show the contribution of human capital to the company's earnings	-
		IC Statement – Made in Germany	optimize the usage of internal and external knowledge	SME
		ICRB	allow the implementation of an IC management and reporting without being limited to one single model for measuring IC	-
		WBV 2010	enable a broad insight into the universities' intellectual capital	Austrian universities
			Main objective	Target businesses

Table 7.5 (continued)

Another characteristic in view was the classification of intellectual capital the approaches use, or if they incorporate one at all. None of the market value oriented models utilize such a categorization, as can be seen in Table 7.6. Reason for this is clearly that these approaches were initially not solely developed for the use in the context of intellectual capital and date back to the mid of the 20's century. Furthermore, only one of the revenue oriented models introduce such a classification, namely the Weightless Wealth Tool Kit. The chief cause for this is probably that it was released only in 2004 while the other approaches in this category were developed ten to twenty years earlier. Moreover, the majority of non-indicator based models use the classic differentiation of intellectual capital into human, structural, and relationship capital; only the Core-Competence Valuation breaks the intangibles down according to another scheme. The models with holistic perspective furthermore utilize various kinds of grouping the IC; these partly introduce new classifications, partly only the human capital is considered. In contrast to this, most of the approaches on intellectual capital reporting again use the classic model on classifying intangibles. One reason for this is certainly their rather late development and release in comparison to the holistic models, as the grouping of intellectual capital into HC, SC, and RC became standard over time.

The next model characteristic under analysis was the question of "did its developers introduce indicators for the assessment of the intellectual capital or not?". Neither the revenue oriented models nor the value added approaches utilize indicators. In distinction from this, nearly all non-monetary indicator based as well as all holistic models incorporate measures, as well as the Intellectual Capital Audit. Concerning the holistic perspective, solely the Intangibles Scoreboard does not support the use of measures; when using the HRA it depends on the single model of use if indicators for IC are utilized or not. Additionally, nearly every approach and guideline on the intangibles' reporting supports the application of IC indicators. Only the "Human Capital Profit and Loss Statement" does not use them. Furthermore, the model feature of "degree of comparability" of the approaches – be it with competitors or the industry – was considered. Such a comparison is possible in almost all of these methods, though might sometimes be difficult to achieve, which is the case, for example, with the Weightless Wealth Tool Kit or the HVA. Reasons for this may be the complexity of the approach and/or the use of customized indicators.

			Classification of IC	Use of indicators for IC	Degree of comparability
IC Measuring Methods	Market Value Oriented Models	Market Value/Book Value Difference	no	no	high
		Market-to-Book Ratio	no	no	high
		Tobin's q	no	no	high
	Revenue Oriented Models	CIV	no	no	high
		Shareholder Value	no	no	high
		Weightless Wealth Tool Kit	5 classes: endowments, skills and tacit knowledge, collective values and norms, technology and explicit knowledge, primary and management processes	no	difficult
	Value Added Approaches	EVA	no	no	no
		MVA	no	no	no
		Intellectual Capital Audit	4 classes: market assets, human-centred assets, infrastructure assets, intellectual property	yes	difficult
	Non-monetary Indicator Based Models	Intangible Assets Monitor	classic model*	yes	low
		Intellectual Capital Navigator	classic model*	yes	high
		CompanyIQ	classic model*	yes	high
		IC Rating	classic model*	yes	high
		Core-Competence Valuation	5 categories: Technology & Explicit Knowledge, Competencies & Implicit Knowledge, Culture & Values, Management processes, Assets & Endowments"	yes	high
		ICBS	classic model*	yes	high
			Classification of IC	Use of indicators for IC	Degree of comparability

* The "classic model" of IC means here the classification of IC in HC, SC and RC.

Table 7.6: Comparison of Models on IC Measuring and Reporting, Part 3

			Classification of IC	Use of indicators for IC	Degree of comparability
IC Measuring Methods	Holistic perspective	BSC	4 classes: HC, SC, RC, plus financial focus	yes	high
		HR Scorecard	only human capital is considered	yes	possible
		Skandia Navigator	5 perspectives: financial focus, customer focus, process focus, renewal and development focus, human focus	yes	high
		HCM	only human capital is considered	yes	high
		Intangibles Scoreboard	3 classes: innovation-related, human resource and organizational intangible assets	no	high
		Value Chain Blueprint	-	yes	possible
		HVA	classic model*	yes	difficult
		IC-dVal	4 groups: structural, human, market and innovation capital	yes	high
		HRA	only human capital is considered	depending on single model	depending on single model
IC Reporting Approaches		Danish "Guideline for Intellectual Capital Statements"	4 groups: employees (which represent human capital), customers, processes, technologies	yes	difficult but possible
		ARC-Wissensbilanz	classic model*	yes	difficult but possible
		Human Capital Profit and Loss Statement	only human capital is considered	no	possible
		IC Statement – Made in Germany	classic model*	yes	high
		ICRB	classic model*	yes	high
		WBV 2010	classic model*	yes	high between universities
			Classification of IC	Use of indicators for IC	Degree of comparability

* The "classic model" of IC means here the classification of IC in HC, SC and RC.

Table 7.6 (continued)

Moreover, the models were compared regarding the purpose on which they can be released. This refers to the use of the approaches either for internal management, or external presentation and communication to stakeholders, or both. All of the models can be utilized for both of these purposes – as displayed in Table 7.7 –, although some designers focused more on the one or the other intent behind their development. The next model feature to be discussed regards the kind of output that can be obtained when implementing the approach. All thirty methods result in a written output like a document or a description of findings when applied; therefore this is not mentioned separately in Table 8. The focus here lies more on the question of obtaining a graphic or numeral output, namely a chart or a ratio – or a report with regard of the IC reporting models –, when implementing the method. Market value oriented models always eventuate in figures, as well as the value added approaches and the revenue oriented models. The Weightless Wealth Toll Kit is an exception in this group as it also aims at finally providing a chart. In contrast to this, the non-indicator based models often result in a graphic output, sometimes supplemented with ratios; only the Core-Competence Valuation solely delivers a numeral outcome. At the holistic perspective all variations of outputs are existent: obtaining a chart, a ratio, or both. The BSC, the Skandia Navigator or the HVA, for instances, result in graphic outputs. On the other hand, the Intangibles Scoreboard or the IC-dVal provide figures. Furthermore, as already mentioned above, all the approaches on intellectual capital reporting deliver some kind of report, often a combination of charts, ratios and a written documentation and/or explanation.

Two final model characteristics were looked at: what kind of publisher developed and/or released the approach, and a description of them. A vast majority of methods were designed by universities or their professors, namely one third of all the models. Only about twenty per cent were developed by businesses, like an auditor in case of the Core-Competence Valuation or an advertising agency in CompanyIQ. Interestingly, half of the approaches on reporting IC were initiated and released by governmental organizations while no model on any of the groups of measuring the intellectual capital was designed or published out of this sphere.

			Purpose	Kind of output	Kind of publisher	Description of publisher
IC Measuring Methods	Market Value Oriented Models	Market Value/Book Value Difference	internal & external	ratio	?	?
		Market-to-Book Ratio	internal & external	ratio	?	?
		Tobin's q	internal & external	ratio	economist	James Tobin
	Revenue Oriented Models	CIV	internal & external	ratio	governmental agency	NCI (National Cancer Institute) Research
		Shareholder Value	internal & external	ratio	university professor	Alfred Rappaport
		Weightless Wealth Tool Kit	internal & external	ratio & chart	auditor	KPMG, Daniel Andriessen
	Value Added Approaches	EVA	internal & external	ratio	consulting	Stern Stewart & Co.
		MVA	internal & external	ratio	consulting	Stern Stewart & Co.
		Intellectual Capital Audit	internal & external	chart	individual	Annie Brooking
	Non-monetary Indicator Based Models	Intangible Assets Monitor	internal & external	chart	university professor	Karl-Erik Sveiby
		Intellectual Capital Navigator	internal & external	chart	individual	Thomas A. Stewart
		CompanyIQ	internal & external	chart	advertising agency	Bates Gruppen
		IC Rating	internal & external	ratio & chart	business	Leif Edvinsson, Intellectual Capital Sweden
		Core-Competence Valuation	internal & external	ratio	auditor	KPMG
		ICBS	internal & external	ratio & chart	university professor	José María Viedma Marti
			Purpose	Kind of output	Kind of publisher	Description of publisher

**** A report is understood here as a compilation of the outcome of the intellectual capital assessment and management, this may comprise also charts and/or ratios.**

Table 7.7: Comparison of Models on IC Measuring and Reporting, Part 4

			Purpose	Kind of output	Kind of publisher	Description of publisher
IC Measuring Methods	Holistic perspective	BSC	internal & external	chart & ratio	economists	Robert S. Kaplan & David P. Norton
		HR Scorecard	internal & external	chart & ratio	university professors	Brian E. Becker, Mark A. Huselid & Dave Ulrich
		Skandia Navigator	internal & external	chart & ratio	university professor	Leif Edvinsson & Michael S. Malone
		HCM	internal & external	chart & ratio	university professor	Andrew Mayo
		Intangibles Scoreboard	internal & external	ratio	university professors	Baruch Lev & Feng Gu
		Value Chain Blueprint	internal & external	chart	university professor	Baruch Lev
		HVA	internal & external	chart & ratio	individual	Göran Roos
		IC-dVal	internal & external	ratio	university professor	Ahmed Bounfour
		HRA	internal & external	ratio	various	various
IC Reporting Approaches		Danish "Guideline for Intellectual Capital Statements"	internal & external	report**	governmental agency	Danish Agency for Trade and Industry of the Ministry of Trade and Industry
		ARC-Wissensbilanz	internal & external	report**	research institute	ARC Seibersdorf
		Human Capital Profit and Loss Statement	internal & external	report**	individual	Jac Fitz-enz
		IC Statement – Made in Germany	internal & external	report**	governmental organization	German Federal Ministry of Economics and Labour
		ICRB	internal & external	report**	university	Department of Knowledge Engineering, University of Vienna
		WBV 2010	primarily external, but also internal	report**	governmental organization	Austrian Federal Ministry of Science and Research
			Purpose	Kind of output	Kind of publisher	Description of publisher

**** A report is understood here as a compilation of the outcome of the intellectual capital assessment and management, this may comprise also charts and/or ratios.**

Table 7.7 (continued)

As a conclusion, it has to be said that all of the above compared thirty approaches have their advantages and disadvantages, their strengths and weaknesses. This was already predicted by Klaus North. It rather depends on the objective and scope of their implementation which model is to favour. To obtain an assessment of intellectual capital and an IC reporting as comprehensive as possible the inclusion of some specific model features appears to be promising. Precisely to prefer the use of models that

- provide both a financial as well as a non-financial assessment of intellectual capital,
- include the classic categorization of intellectual capital into human, structural, and relationship capital,
- use indicators for the assessment of the intellectual capital,
- allow a comparison with competitors and/or the industry,
- enable internal management with as well as external presentation of the assessment's outcomes and
- deliver a report, comprising also some kind of chart and/or ratio.

Another crucial finding is that the majority of intellectual capital measurements start with deciding on the company's strategy and/or the goal of the assessment. One could now argue that models of the holistic perspective should be preferred for the assessment of intellectual capital: they use monetary and non-monetary evaluation methods; they enable relying on financial ratios as well as meeting and partially solving the difficulty of measurability of intangibles. Moreover, these methods allow planning in favour of company goals and illustrate the significance or unimportance of intellectual assets. With the conclusion given above stage 1 of the process this thesis focuses on is finished. The next step is to introduce the technology stage 2 deals with: the business rules.³⁶⁴

³⁶⁴More details on these stages and the whole underlying process of this thesis can be found in section 3.2.

Chapter 8

Introduction to Business Rules

As explained above, the business rules are used as the technical foundation for the design of the control system for implementing intellectual capital measuring and reporting on the basis of compliance. In the following, the term "business rules" is defined at first, then the reasons for utilizing them in the context of this thesis are stated, and then finally the rules' design is illustrated.

Technology

Stage 2

8.1 Definition

The basic definition of the term "business rule" given by the "Object Management Group" is basically that it is "a rule that is under business jurisdiction"³⁶⁵.³⁶⁶ Barbara von Halle, who is pioneer in this field of research and activity, furthermore defines business rules as "[...] consistent, high-quality rules and facts that are available to decision makers and systems."³⁶⁷

8.2 Why using Business Rules?

As the instructions for the implementation of intellectual capital measuring and reporting in small and medium-sized businesses based on compliance need to be easy understandable as well as realizable, the use of a business rules approach seems a fertile choice. In the following, it will be explained why.

³⁶⁵OMG08, p. 8.

³⁶⁶Besides, there exists the so-called "Business Rules Manifesto" in which "The Principles of Rule Independence" are written down by the organization "Business Rules Group". This document can be found under <http://www.businessrulesgroup.org/brmanifesto/BRManifesto.pdf>, Access: 2012-05-24.

³⁶⁷vonH02, p. 3.

According to von Halle³⁶⁸, business rules serve managers as well as employees as guidance in making decisions quite fast and based on division- or even company-wide standards. Furthermore, they enable achieving strategic goals easier and therefore also increase the chance of their occurrence. For van Halle³⁶⁹, it has to be differentiated between business and workflow rules. The latter scan the actual situation in an environment and direct which step comes next, while the former give instructions on how to execute an individual stage in the system. Essential criteria for business rules to be useful are their clarity in description, their easy accessibility, and their ability to be changed and updated if time or circumstances demand it. Von Halle precisely names ten advantages in designing and implementing a system based on business rules: "Simplicity", "Theoretical base", "Small number of necessary, nontechnical concepts", "Rule independence", "Ease of application development", "Rule reuse", "Simplified systems design", "Dynamic rules", "Performance", and "Incremental systems delivery".³⁷⁰

The Swiss business consultants Markus Schacher and Patrick Grässle moreover bring the following arguments in the favour of business rules: for them, business rules illustrate the employee's attitude and motivation; they help gathering and retaining the knowledge inside the organization; business rules assist in identifying inconsistencies regarding the rules within the firm; and finally they allow for collective behaviour throughout the whole company.³⁷¹ Consequently, if business rules are efficient and reasonable they may motivate the staff further, allow the business for acting faster if the circumstances change, and they can facilitate companies the compliance to regulation as well as their documentation. One final but highly important reason for elaborating a business rules system in this thesis is that the user – that would be the information systems department together with human resources – can change the rules on their own without needing the support of IT.³⁷²

8.3 The Rules' Design

For composing business rules, so-called rule templates are very useful. "*Rule templates* are disciplined patterns by which a business rule is expressed as a combination of rule

³⁶⁸Cf. vonH02.

³⁶⁹Cf. vonH02.

³⁷⁰Concrete information on these advantages can be found in vonH02, pp. 10-11.

³⁷¹Cf. ScGr06, p. 13.

³⁷²Cf. ScGr06, p. 29-30.

clauses."³⁷³, as Barbara von Halle explains. In this context the author names "[...] seven different kinds of business rule classifications needing templates: terms, facts, mandatory constraints, guidelines, inferences, action enablers, and computations."³⁷⁴ Table 8.1 gives some details on these categorizations; of particular interest for the further steps in this thesis are here the templates itself.

With the elaboration of the chapter concerning business rules, stage 2 of this thesis' process has been completed³⁷⁵. Now, both stage 1 and 2 are finished; their output can now be used for designing the rules for the control system on intellectual capital measuring and reporting as well as compliance management.

BUSINESS RULE CLASSIFICATION	DETAILED DEFINITION OF BUSINESS RULE CLASSIFICATION	RULE TEMPLATE
Term	Noun or noun phrase with an agreed-upon definition, can be divided into: • Concept, object class, entity • Property, detail, attribute • Value • Value set	<term> IS DEFINED AS <text>
Fact	Statement connecting terms into sensible, business-relevant observations: • Entity-to-entity relationship • Entity-to-attribute assignment • Supertype-to-supertype connection	<term1> IS A <term2> <term1> <verb> <term2> <term1> IS COMPOSED OF <term2> <term1> IS A ROLE PLAYED BY <term2> <term1> HAS A PROPERTY OF <term2>
Computation	Statement providing algorithm on numeric data for arriving at the value of a term. Computes the value of one term. May reference many terms in formula.	<term1> IS COMPUTED AS <formula>

Table 8.1: Business Rule Templates³⁷⁶

³⁷³vonH02, p. 39.

³⁷⁴vonH02, p. 39.

³⁷⁵More details on this process as well as the overall approach underlying this thesis provides section 3.2.

³⁷⁶Cf. vonH02, pp. 40-41.

BUSINESS RULE CLASSIFICATION	DETAILED DEFINITION OF BUSINESS RULE CLASSIFICATION	RULE TEMPLATE
Mandatory constraint	Statement expressing circumstances that must be true of input information.	<term1> MUST HAVE <at least, at most, exactly <i>n</i> of> <term2> <term1> MUST BE <comparison> <term2>, <value>, <value list> <term1> MUST BE IN LIST <a,b,c> <term1> MUST NOT BE IN LIST <a,b,c> IF <rule phrase(s)> THEN <constraint of any of the above types>
Guideline	Statement expressing circumstances that must be true of input information.	<term1> SHOULD HAVE <at least, at most, exactly <i>n</i> of> <term2> <term1> SHOULD BE <comparison> <term2>, <value>, <value list> <term1> SHOULD BE IN LIST <a, b, c> <term1> SHOULD NOT BE IN LIST <a, b, c> IF <rule phrase(s)> THEN <constraint of any of the above types>
Inferred knowledge	Statement expressing circumstances that lead to a new piece of information.	IF <term1> <operator> <term2, value, value list> AND <again> THEN <term3> <operator> <term4> Where operator can be: Comparison (=, not =, <=, >=, <, >) In, not in Has quantity <at least <i>n</i>, at most <i>n</i>, exactly <i>n</i>> of
Action enabler	Statement expressing circumstances that lead to external event.	IF <term1> <operator> <term2> THEN <action>

Table 8.1 (continued)

Chapter 9

Formulating the Control System using Business Rules

In the following chapter, the control system using business rules is formulated. Furthermore, a practical example is introduced to show how this system is applied for the implementation in practice.

9.1 The Control System

First of all, the business rules constituting the control system on the implementation of intellectual capital measuring and reporting in the context of compliance are presented.



All above introduced regulations on compliance as well as approaches on IC measuring and reporting have been regarded for the rules' design. In this context, only those of single laws and directives were considered which are currently in force; hence, SOLVENCY II and BASEL III are omitted. Moreover, the control system is mainly designed for SMBs based and/or operating in the European Union and/or the United States of America. The business rules are basically organized in the order of the comparison's findings from above.

Beside the rule itself a Rule ID, the Type of Rule, its Business Object, its Priority and a Definition of the Rule were formulated for each of the rules and are displayed in the following. These rule features were derived from Barbara von Halle's introduced examples on the design of business rules.³⁷⁷ Table 9.1 displays the designed business rules for the control

³⁷⁷Cf. vonH02, p. 446-449 and p. 518-522.

system.

One further suggestion shall be made here: the following rules themselves are also part of a business' intellectual capital, namely belonging to the class of structural capital.

Rule ID	Type of Rule	Business Object	Priority	Rule	Definition
M_comannrep	Mandatory constraint	Regulation	MUST RELEASE	<company> MUST RELEASE <annual report>	A company basically has to publish an annual report.
T_com	Term	Model, Report, Regulation	IS DEFINED AS	<company> IS DEFINED AS <an operating business>	Definition of the term "company"
T_annrep	Term	Regulation	IS DEFINED AS	<annual report> IS DEFINED AS <the financial information the company has to release each year>	Definition of the term "annual report"
M_annrepreg	Mandatory constraint	Regulation	MUST BASE ON	<annual report> MUST BASE ON <regulation>	A company's annual report has to be compiled in compliance with the regulation the firm has to obey to.
G_annrepmodep	Guideline	Model, Report, Regulation	SHOULD INCLUDE	<annual report> SHOULD INCLUDE <model> OR <report>	An annual report should include the results of an IC model or an IC report for enhanced information of their stakeholders.
Rule ID	Type of Rule	Business Object	Priority	Rule	Definition

Table 9.1: The Business Rules for the Control System for the implementation of Intellectual Capital Measuring and Reporting in SMBs on the Basis of Compliance³⁷⁸

Rule ID	Type of Rule	Business Object	Priority	Rule	Definition
T_mod	Term	Model	IS DEFINED AS	<model> IS DEFINED AS <an approach on the measuring of intellectual capital>	Definition of the term “model”
T_rep	Term	Report	IS DEFINED AS	<report> IS DEFINED AS <a compilation of the outcome of the intellectual capital measuring>	Definition of the term “report”
I_comU SAhivS MB	Inferred knowledge	Regulation	IF THEN	IF <company> IS BASED IN <USA> AND <employees> < <500> AND IS <exporting service firm with high value> AND <annual revenue> <= <\$25 million> THEN <company> IS <SMB>	In the United States of America a high value-exporting service firm with less than 500 employees and an annual revenue of less than or equal to \$25 million is defined as an SMB.
T_USA	Term	Regulation	IS DEFINED AS	<USA> IS DEFINED AS <the United States of America>	Definition of the term “USA”
T_emp	Term	Regulation	IS DEFINED AS	<employees> IS DEFINED AS <the number of people employed in a company>	Definition of the term “employees”
Rule ID	Type of Rule	Business Object	Priority	Rule	Definition

Table 9.1 (continued)

Rule ID	Type of Rule	Business Object	Priority	Rule	Definition
T_hiv	Term	Regulation	IS DEFINED AS	<exporting service firm with high value> IS DEFINED AS <a service firm with business focus on exporting and an annual revenue of less than or equal to \$25 million>	Definition of the term “exporting service firm with high value”
T_annrev	Term	Regulation	IS DEFINED AS	<annual revenue> IS DEFINED AS <the company’s sales per year>	Definition of the term “annual revenue”
T_SMB	Term	Regulation	IS DEFINED AS	<SMB> IS DEFINED AS <a small and medium-sized business>	Definition of the term “SMB”
I_comUS A low SMB	Inferred knowledge	Regulation	IF THEN	IF <company> IS BASED IN <USA> AND <employees> < <500> AND IS <exporting service firm without high value> and <annual revenue> <= <\$7 million> THEN <company> IS <SMB>	In the United States of America an exporting firm without high value, with less than 500 employees and an annual revenue of less than or equal to \$7 million is defined as an SMB.
Rule ID	Type of Rule	Business Object	Priority	Rule	Definition

Table 9.1 (continued)

Rule ID	Type of Rule	Business Object	Priority	Rule	Definition
T_low	Term	Regulation	IS DEFINED AS	<exporting service firm without high value> IS DEFINED AS <a service firm with business focus on exporting and an annual revenue of less than or equal to \$7 million>	Definition of the term “exporting service firm without high value”
I_comU SAfarm SMB	Inferred knowledge	Regulation	IF THEN	IF <company> IS BASED IN <USA> AND <employees> < <500> AND IS <farm> and <annual revenue> <= <\$250,000> THEN <company> IS <SMB>	In the United States of America a farm with less than 500 employees and an annual revenue of less than or equal to \$250,000 is defined as an SMB.
I_comE USMB	Inferred knowledge	Regulation	IF THEN	IF <company> IS BASED IN <EU> AND <employees> < <250> AND [<annual turnover> <= <€50 million> OR <balance sheet total> <= <€43 million>] THEN <company> IS <SMB>	In the European Union an SMB is defined as a company with less than 250 employees, and an annual turnover of less than or equal to €50 million or a balance sheet total of less than or equal to €43 million.
T_EU	Term	Regulation	IS DEFINED AS	<EU> IS DEFINED AS <the European Union>	Definition of the term “EU”
Rule ID	Type of Rule	Business Object	Priority	Rule	Definition

Table 9.1 (continued)

Rule ID	Type of Rule	Business Object	Priority	Rule	Definition
T_anntov	Term	Regulation	IS DEFINED AS	<annual turnover> IS DEFINED AS <the company's sales per year>	Definition of the term "annual turnover"
F_aanturrev	Fact	Regulation	IS EQUAL TO	<annual turnover> IS EQUAL TO <annual revenue>	Here, the term "annual turnover" is exchangeable for "annual revenue".
T_balshetot	Term	Regulation	IS DEFINED AS	<balance sheet total> IS DEFINED AS <the value of the company's total assets>	Definition of the term "balance sheet total"
F_regOECDIFRS	Fact	Regulation	IS COMPOSED OF	<regulation> IS COMPOSED OF <OECD> AND <IFRS> AND <SOLVENCY I> AND <MiFID> AND <EuroSOX> AND <SOX> AND <US GAAP> AND <HIPAA> AND <FATCA> AND <BASEL II> AND <ACCG> AND <KonTraG> AND <COSO> AND <COBIT> AND <LSSE>	Regulations on compliance comprise the OECD Principles, the IFRS, the SOLVENCY I, the MiFID, the EuroSOX, the SOX, the US GAAP, the HIPAA, the FATCA, the BASEL II, the Austrian Code of Corporate Governance, the KonTraG, the frameworks COSO and COBIT, and the Listing Standards of Stock Exchanges.
Rule ID	Type of Rule	Business Object	Priority	Rule	Definition

Table 9.1 (continued)

Rule ID	Type of Rule	Business Object	Priority	Rule	Definition
T_reg	Term	Regulation	IS DEFINED AS	<regulation> IS DEFINED AS <some kind of regulation on compliance, e.g. a law or a directive>	Definition of the term "regulation"
T_OECD	Term	Regulation	IS DEFINED AS	<OECD> IS DEFINED AS <the OECD principles>	Definition of the term "OECD"
T_IFRS	Term	Regulation	IS DEFINED AS	<IFRS> IS DEFINED AS <the International Financial Reporting Standards>	Definition of the term "IFRS"
T_MiFID	Term	Regulation	IS DEFINED AS	<MiFID> IS DEFINED AS <the European Markets in Financial Instruments Directive>	Definition of the term "MiFID"
T_ESOX	Term	Regulation	IS DEFINED AS	<EuroSOX> IS DEFINED AS <the EU directive 2006/43/EC>	Definition of the term "EuroSOX"
T_SOX	Term	Regulation	IS DEFINED AS	<SOX> IS DEFINED AS <the Sarbanes-Oxley Act of 2002>	Definition of the term "SOX"
T_US GAAP	Term	Regulation	IS DEFINED AS	<US GAAP> IS DEFINED AS <the United States Generally Accepted Accounting Principles>	Definition of the term "US GAAP"
Rule ID	Type of Rule	Business Object	Priority	Rule	Definition

Table 9.1 (continued)

Rule ID	Type of Rule	Business Object	Priority	Rule	Definition
T_HIPAA	Term	Regulation	IS DEFINED AS	<HIPAA> IS DEFINED AS <the Health Insurance Portability and Accounting Act>	Definition of the term "HIPAA"
T_FATCA	Term	Regulation	IS DEFINED AS	<FATCA> IS DEFINED AS <the Foreign Account Tax Compliant Act>	Definition of the term "FATCA"
T_ACCG	Term	Regulation	IS DEFINED AS	<ACCG > IS DEFINED AS <the Austrian Code of Corporate Governance>	Definition of the term "ACCG"
T_KonTraG	Term	Regulation	IS DEFINED AS	<KonTraG> IS DEFINED AS <the Corporate Sector Supervision and Transparency Act>	Definition of the term "KonTraG"
T_LSSE	Term	Regulation	IS DEFINED AS	<LSSE> IS DEFINED AS <rules specified by a stock exchange>	Definition of the term "LSSE"
G_SMB OECD	Guideline	Regulation	SHOULD OBEY	<SMB> SHOULD OBEY <OECD>	An SMB basically has the choice of applying the OECD principles or not, but it seems preferable to obey to it.
A_SMB EUIFRS	Action enabler	Regulation	IF THEN SHOULD OBEY	IF <SMB> IS BASED IN <EU> THEN <SMB> SHOULD OBEY <IFRS>	A European SMB basically has the choice of applying the IFRS or not, but it seems preferable to obey to it.
Rule ID	Type of Rule	Business Object	Priority	Rule	Definition

Table 9.1 (continued)

Rule ID	Type of Rule	Business Object	Priority	Rule	Definition
A_SMB EUSEIF RS	Action enabler	Regulation	IF THEN MUST OBEY	IF <SMB> IS BASED IN <EU> AND IS LISTED AT <SE> AND <SE> IS BASED IN <EU> THEN <SMB> MUST OBEY <IFRS>	A European SMB which is listed at at least one European stock exchange basically has to comply with the IFRS.
T_SE	Term	Regulation	IS DEFINED AS	<SE> IS DEFINED AS <the stock exchange, namely a market where a company's shares are traded>	Definition of the term "SE"
A_SMB EUinsre i	Action enabler	Regulation	IF THEN MUST OBEY	IF <SMB> IS BASED IN <EU> AND OPERATES IN <insurance and reinsurance businesses> THEN <SMB> MUST OBEY <SOLVENCY I>	A European SMB which operates in the insurance or reinsurance businesses basically has to comply with SOLVENCY I.
T_insrei bus	Term	Regulation	IS DEFINED AS	<insurance and reinsurance businesses> IS DEFINED AS <companies whose business activities cardinally comprise insurances and reinsurances>	Definition of the term "insurance and reinsurance businesses"
Rule ID	Type of Rule	Business Object	Priority	Rule	Definition

Table 9.1 (continued)

Rule ID	Type of Rule	Business Object	Priority	Rule	Definition
A_SMB EEAinv bus	Action enabler	Regulation	IF THEN MUST OBEY	IF <SMB> IS BASED IN <EEA> AND OPERATES IN <investment business> THEN <SMB> MUST OBEY <MiFID>	A European SMB which operates in the investment business basically has to comply with the MiFID.
T_EEA	Term	Regulation	IS DEFINED AS	<EEA> IS DEFINED AS <the European Economic Area>	Definition of the term “EEA”
T_invbu s	Term	Regulation	IS DEFINED AS	<investment business> IS DEFINED AS <companies whose business activities cardinally comprise investments>	Definition of the term “investment business”
A_SMB EUESO X	Action enabler	Regulation	IF THEN MUST OBEY	IF <SMB> IS BASED IN <EU> THEN <SMB> MUST OBEY <EuroSOX>	A European SMB basically has to comply with EuroSOX.
A_SMB USSE	Action enabler	Regulation	IF THEN MUST OBEY	IF <SMB> IS LISTED AT <SE> BASED IN <USA> THEN <SMB> MUST OBEY <SOX> AND <US GAAP>	SMBs with stocks listed at one of the stock exchanges in the United States of America basically have to comply with SOX and the US GAAP.
F_USS E	Fact	Regulation	IS COMPOSED OF	<SE> BASED IN <USA> IS COMPOSED OF <NYSE> AND <NASDAQ> AND <AMEX>	The US stock exchanges comprise the NYSE, the NASDAQ and the AMEX.
Rule ID	Type of Rule	Business Object	Priority	Rule	Definition

Table 9.1 (continued)

Rule ID	Type of Rule	Business Object	Priority	Rule	Definition
T_NYSE	Term	Regulation	IS DEFINED AS	<NYSE> IS DEFINED AS <the New York Stock Exchange>	Definition of the term "NYSE"
T_NASDAQ	Term	Regulation	IS DEFINED AS	<NASDAQ> IS DEFINED AS <the NASDAQ Stock Market>	Definition of the term "NASDAQ"
T_AMEX	Term	Regulation	IS DEFINED AS	<AMEX> IS DEFINED AS <the American Stock Exchange>	Definition of the term "AMEX"
A_SMBUSAhe aind	Action enabler	Regulation	IF THEN MUST OBEY	IF <SMB> IS BASED IN <USA> AND OPERATES IN <health industry> THEN <SMB> MUST OBEY <HIPAA>	A US SMB which operates in the health industry basically has to comply with the HIPAA.
A_SMBbansec	Action enabler	Regulation	IF THEN MUST OBEY	IF <SMB> OPERATES IN <financial services sector> AND HOLDS <foreign financial asset> THEN <SMB> MUST OBEY <FATCA>	SMBs which operate in the US financial services sector and which hold assets of non-US companies basically do have to obey the FATCA.
T_bans ec	Term	Regulation	IS DEFINED AS	<financial services sector> IS DEFINED AS <banks and other companies operating in financial services>	Definition of the term "financial services sector"
Rule ID	Type of Rule	Business Object	Priority	Rule	Definition

Table 9.1 (continued)

Rule ID	Type of Rule	Business Object	Priority	Rule	Definition
T_forfin ass	Term	Regulation	IS DEFINED AS	<foreign financial asset> IS DEFINED AS <financial assets of non-US-based companies>	Definition of the term "foreign financial asset"
G_SMB bansec	Guideline	Regulation	IF THEN SHOULD OBEY	IF <SMB> OPERATES IN <financial services sector> THEN <SMB> SHOULD OBEY <BASEL II>	An SMB basically has the choice of applying Basel II or not, but it seems preferable to obey to it.
A_SMB PMVSE	Action enabler	Regulation	IF THEN MUST OBEY	IF <SMB> < IS LISTED AT <Prime Market> OF <VSE> THEN <SMB> MUST OBEY <ACCG>	SMBs with stocks listed at the Prime Market of the Vienna Stock Exchange do basically have to comply with the Austrian Code of Corporate Governance.
T_PMV SE	Term	Regulation	IS DEFINED AS	<Prime Market of VSE > IS DEFINED AS <a sector of the VSE>	Definition of the term "Prime Market of VSE"
F_VSE PM	Fact	Regulation	IS COMPOSED OF	<VSE> IS COMPOSED OF <Prime Market of the VSE>	The Prime Market is one sector of the VSE.
T_VSE	Term	Regulation	IS DEFINED AS	<VSE> IS DEFINED AS <the Vienna Stock Exchange>	Definition of the term "VSE"
Rule ID	Type of Rule	Business Object	Priority	Rule	Definition

Table 9.1 (continued)

Rule ID	Type of Rule	Business Object	Priority	Rule	Definition
A_SMB Ger	Action enabler	Regulation	IF THEN MUST OBEY	IF <SMB> IS BASED IN <Germany> THEN <SMB> MUST OBEY <KonTraG>	A German SMB basically has to comply with the KonTraG.
G_SMB COSO	Guideline	Regulation	MIGHT OBEY	<SMB> MIGHT OBEY <COSO>	Every company could use COSO for their compliance management.
F_COSO	Fact	Regulation	IS A	<COSO> IS A <framework>	Definition of the term "COSO"
T_fra	Term	Regulation	IS DEFINED AS	<framework> IS DEFINED AS <a scheme which supports compliance management>	Definition of the term "framework"
G_SMB COBIT	Guideline	Regulation	MIGHT OBEY	<SMB> MIGHT OBEY <COBIT>	Every company could use COBIT for their compliance management.
F_COBIT	Fact	Regulation	IS A	<COBIT> IS A <framework>	Definition of the term "COBIT"
A_SMB SE	Action enabler	Regulation	IF THEN MUST OBEY	IF <SMB> IS LISTED AT <SE> THEN <SMB> MUST OBEY <LSSE> OF <SE>	An SMB which is listed at a stock exchange basically has to obey its listing standards.
G_Mfin non	Guideline	Model	SHOULD USE	<model> SHOULD USE <financial assessment> AND <non-financial assessment>	Models should apply financial as well as non-financial assessments for the valuation of intellectual capital.
Rule ID	Type of Rule	Business Object	Priority	Rule	Definition

Table 9.1 (continued)

Rule ID	Type of Rule	Business Object	Priority	Rule	Definition
T_finas s	Term	Model	IS DEFINED AS	<financial assessment> IS DEFINED AS <the valuation of intellectual capital using financial company data plus financial computations>	Definition of the term “financial assessment”
T_nona ss	Term	Model	IS DEFINED AS	<non-financial assessment> IS DEFINED AS <the evaluation of intellectual capital using assessment approaches other than financial valuation methods>	Definition of the term “non-financial assessment”
G_Mcla mod	Guideline	Model	SHOULD USE	<model> SHOULD USE <classic model>	Models should use the classic model for classifying intellectual capital into human, structural, and relationship capital.
T_clam odhcsr c	Term	Model, Report	IS DEFINED AS	<classic model> IS DEFINED AS <the classification of intellectual capital into human, structural and relationship capital>	Definition of the term “classic model”
Rule ID	Type of Rule	Business Object	Priority	Rule	Definition

Table 9.1 (continued)

Rule ID	Type of Rule	Business Object	Priority	Rule	Definition
F_clam odhcsc	Fact	Model, Report	IS COMPOSED OF	<classic model> IS COMPOSED OF <human capital> AND <structural capital> AND <relationship capital>	The standard classification of intellectual is the one into human, structural, and relationship capital.
F_strcap	Fact	Model, Report	IS EQUAL TO	<structural capital> IS EQUAL TO <organizational capital>	Structural capital is also named organizational capital.
F_relcap	Fact	Model, Report	IS EQUAL TO	<relationship capital> IS EQUAL TO <customer capital>	Relationship capital is also named customer capital.
G_Rclamod	Guideline	Report	SHOULD USE	<report> SHOULD USE <classic model>	Reports should use the classic model for the classification of intellectual capital into human, structural, and relationship capital.
F_repstatement	Fact	Report	IS EQUAL TO	<report> IS EQUAL TO <statement>	A report can also be called statement.
G_Mind	Guideline	Model	SHOULD USE	<model> SHOULD USE <indicator>	Models should incorporate the use of indicators for the assessment of intellectual capital.
T_ind	Term	Model	IS DEFINED AS	<indicator> IS DEFINED AS <a measure for the intellectual capital>	Definition of the term "indicator"
Rule ID	Type of Rule	Business Object	Priority	Rule	Definition

Table 9.1 (continued)

Rule ID	Type of Rule	Business Object	Priority	Rule	Definition
G_Mcom	Guideline	Model	SHOULD ENABLE	<model> SHOULD ENABLE <comparison>	The models' output should allow for a comparison with competitors or the industry.
T_com	Term	Model	IS DEFINED AS	<comparison> IS DEFINED AS <a match with a competitor or the industry>	Definition of the term "comparison"
G_Mintext	Guideline	Model	SHOULD ENABLE	<model> SHOULD ENABLE <internal management> AND <external presentation>	Models should be of use for internal management as well as external presentation.
G_Rintext	Guideline	Report	SHOULD ENABLE	<report> SHOULD ENABLE <internal management> AND <external presentation>	Reports should be of use for internal management as well as external presentation.
M_Mintext	Mandatory constraint	Model	MUST ENABLE	<model> MUST ENABLE <internal management> OR <external presentation>	A model must in any case be of use either for internal management or for external presentation.
M_Rintext	Mandatory constraint	Report	MUST ENABLE	<report> MUST ENABLE <internal management> OR <external presentation>	A report must in any case be of use either for internal management or for external presentation.
Rule ID	Type of Rule	Business Object	Priority	Rule	Definition

Table 9.1 (continued)

Rule ID	Type of Rule	Business Object	Priority	Rule	Definition
T_intmgt	Term	Model, Report	IS DEFINED AS	<internal management> IS DEFINED AS <the administration of intellectual capital within the company>	Definition of the term “internal management”
T_extpre	Term	Model, Report	IS DEFINED AS	<external presentation> IS DEFINED AS <the communication of value of intellectual capital to the company's stakeholders>	Definition of the term “external presentation”
G_Mrep	Guideline	Model	SHOULD ENABLE	<model> SHOULD ENABLE <report>	The models' implementation should deliver a report.
M_repharat	Mandatory constraint	Report	MUST ENABLE	<report> MUST ENABLE <chart> AND <ratio>	A report must enable the inclusion of a chart as well as a ratio.
M_repharat2	Mandatory constraint	Report	MUST HAVE	<report> MUST HAVE <chart> OR <ratio>	A report must at least comprise a chart or a ratio.
T_cha	Term	Report	IS DEFINED AS	<chart> IS DEFINED AS <a graphic or figure>	Definition of the term “chart”
T_rat	Term	Report	IS DEFINED AS	<ratio> IS DEFINED AS <a number or a rate>	Definition of the term “ratio”
Rule ID	Type of Rule	Business Object	Priority	Rule	Definition

Table 9.1 (continued)

Rule ID	Type of Rule	Business Object	Priority	Rule	Definition
G_Mobj	Guideline	Model	SHOULD ENABLE	<model> SHOULD ENABLE <objective>	When applying the model it should enable the implementer to define the overall objective of its application.
T_obj	Term	Model	IS DEFINED AS	<objective> IS DEFINED AS <a desired goal or outcome for undertaking an intellectual capital assessment>	Definition of the term “objective”
G_Rfinrep	Guideline	Report	SHOULD SUPPLEMENT	<report> SHOULD SUPPLEMENT <financial report>	The intellectual capital report should be used as a supplement to the financial or annual report of a company.
T_finrep	Term	Report	IS DEFINED AS	<financial report> IS DEFINED AS <a company’s annual documentation on business activities>	Definition of the term “financial report”
F_annrirep	Fact	Report	IS EQUAL TO	<annual report> IS EQUAL TO <financial report>	Here, the term “annual report” is exchangeable for “financial report”.
G_Cmoldrep	Guideline	Model, Report	SHOULD USE	<company> SHOULD USE <model> OR <report>	It is recommended that every business should implement an intellectual capital measurement and/or reporting.
Rule ID	Type of Rule	Business Object	Priority	Rule	Definition

Table 9.1 (continued)

Rule ID	Type of Rule	Business Object	Priority	Rule	Definition
F_Mma rmodrev modval app	Fact	Model	IS COMPOSED OF	<model> IS COMPOSED OF <market model> AND <revenue model> AND <value approach> AND <Intellectual Capital Audit> AND <non-monetary model> AND <holistic model>	Models comprise Market Value Oriented Models, Revenue Oriented Models, Value Added Approaches, the Intellectual Capital Audit, Non- monetary Indicator Based Models and models with Holistic Perspective.
T_mar mod	Term	Model	IS DEFINED AS	<market model> IS DEFINED AS <the Market Value Oriented Models>	Definition of the term "market model"
T_rev mod	Term	Model	IS DEFINED AS	<revenue model> IS DEFINED AS <the Revenue Value Oriented Models>	Definition of the term "revenue model"
T_valap p	Term	Model	IS DEFINED AS	<value approach> IS DEFINED AS <the Value Added Approaches>	Definition of the term "value approach"
T_nonm od	Term	Model	IS DEFINED AS	<non-monetary model> IS DEFINED AS <the Non-monetary Indicator Based Models>	Definition of the term "non-monetary model"
T_holm od	Term	Model	IS DEFINED AS	<holistic model> IS DEFINED AS <the models of the Holistic Perspective>	Definition of the term "holistic model"
Rule ID	Type of Rule	Business Object	Priority	Rule	Definition

Table 9.1 (continued)

Rule ID	Type of Rule	Business Object	Priority	Rule	Definition
F_mar modass	Fact	Model	USES	<market model> USES <financial assessment>	The Market Value Oriented Models provide financial assessments.
M_mar modSM BSE	Mandatory constraint	Model	MUST BE LISTED AT	IF <SMB> USES <market model> THEN <SMB> MUST BE LISTED AT <SE>	Only a listed company can apply the Market Value Oriented Models.
F_mar modmb drTq	Fact	Model	IS COMPOSED OF	<market model> IS COMPOSED OF <market/book difference> AND <market-book- ratio> AND <Tobin's q>	The Market Value/Book Value Difference, the Market-to-Book Ratio and Tobin's q are Market Value Oriented Models.
C_mbd	Computation	Model	IS COMPUTED AS	<market/book difference> IS COMPUTED AS <market value – book value>	The Market/Book Value Difference is computed as the market value minus the book value.
C_mbr	Computation	Model	IS COMPUTED AS	<market-book- ratio> IS COMPUTED AS <market value / book value>	The Market-to-Book Ratio is computed as the market value divided by the book value.
C_Tsq	Computation	Model	IS COMPUTED AS	<Tobin's q> IS COMPUTED AS <market value / replacement cost of assets>	Tobin's q is computed as the market value divided by the replacement cost of assets.
F_rev modass	Fact	Model	USES	<revenue model> USES <financial assessment>	The Revenue Value Oriented Models provide financial assessments.
Rule ID	Type of Rule	Business Object	Priority	Rule	Definition

Table 9.1 (continued)

Rule ID	Type of Rule	Business Object	Priority	Rule	Definition
F_revmodCIVSV	Fact	Model	IS COMPOSED OF	<revenue model> IS COMPOSED OF <CIV> AND <Shareholder Value> AND <Weightless Wealth Tool Kit>	The Revenue Oriented Models comprise the CIV, the Shareholder Value and the Weightless Wealth Tool Kit.
T_CIV	Term	Model	IS DEFINED AS	<CIV> IS DEFINED AS <the Calculated Intangible Value>	Definition of the term "CIV"
M_SV	Mandatory constraint	Model	MUST BE LISTED	IF <SMB> USES <Shareholder Value> THEN <SMB> MUST BE LISTED AT <SE>	Only a listed company can apply the Shareholder Value model.
G_SMBkicWTK	Guideline	Model	SHOULD USE	IF <SMB> IS <knowledge-intensive company> THEN <SMB> SHOULD USE <Weightless Wealth Tool Kit>	The Weightless Wealth Tool Kit was primarily developed for the implementation in knowledge-intensive companies and should therefore be applied there.
T_kic	Term	Model	IS DEFINED AS	<knowledge-intensive company> IS DEFINED AS <a company whose prime business is closely connected to knowledge>	Definition of the term "knowledge-intensive company"
F_valapass	Fact	Model	USES	<value approach> USES <financial assessment>	The Value Added Approaches provide financial assessments.
Rule ID	Type of Rule	Business Object	Priority	Rule	Definition

Table 9.1 (continued)

Rule ID	Type of Rule	Business Object	Priority	Rule	Definition
F_valap pEMVA	Fact	Model	IS COMPOSED OF	<value approach> IS COMPOSED OF <EVA> AND <MVA>	The Value Added Approaches comprise the EVA and the MVA.
T_EVA	Term	Model	IS DEFINED AS	<EVA> IS DEFINED AS <the Economic Value Added>	Definition of the term "EVA"
T_MVA	Term	Model	IS DEFINED AS	<MVA> IS DEFINED AS <the Market Value Added>	Definition of the term "MVA"
F_ICAass	Fact	Model	USES	<Intellectual Capital Audit> USES <non- financial assessment>	The Intellectual Capital Audit provides a non-financial assessment.
F_nonm odass	Fact	Model	USES	<non-monetary model> USES <non-financial assessment>	The Non-monetary Indicator Based Models provide non-financial assessments.
F_nonm odIAMICN	Fact	Model	IS COMPOSED OF	<non-monetary model> IS COMPOSED OF <Intangible Assets Monitor> AND <Intellectual Capital Navigator> AND <CompanyIQ> AND <IC Rating> AND <Core- Competence Valuation> AND <ICBS>	The Non-monetary Indicator Based Models comprise the Intangible Assets Monitor, the Intellectual Capital Navigator, the CompanyIQ, the IC Rating, the Core-Competence Valuation, and the ICBS.
Rule ID	Type of Rule	Business Object	Priority	Rule	Definition

Table 9.1 (continued)

Rule ID	Type of Rule	Business Object	Priority	Rule	Definition
F_IAM mod	Fact	Model	USES	<Intangible Assets Monitor> USES <classic model>	The Intangible Assets Monitor utilizes the classic model for classifying intellectual capital.
F_ICN mod	Fact	Model	USES	<Intellectual Capital Navigator> USES <classic model>	The Intellectual Capital Navigator utilizes the classic model for classifying intellectual capital.
F_CIQ mod	Fact	Model	USES	<CompanyIQ> USES <classic model>	CompanyIQ utilizes the classic model for classifying intellectual capital.
F_ICR mod	Fact	Model	USES	<IC Rating> USES <classic model>	IC Rating utilizes the classic model for classifying intellectual capital.
T_ICBS	Term	Model	IS DEFINED AS	<ICBS> IS DEFINED AS <the Intellectual Capital Benchmarking System>	Definition of the term "ICBS"
F_ICBS mod	Fact	Model	USES	<ICBS> USES <classic model>	The Intellectual Capital Benchmarking System utilizes the classic model for classifying intellectual capital.
Rule ID	Type of Rule	Business Object	Priority	Rule	Definition

Table 9.1 (continued)

Rule ID	Type of Rule	Business Object	Priority	Rule	Definition
F_holm odass	Fact	Model	USES	<holistic model> USES <financial assessment> AND <non-financial assessment>	The models of the Holistic Perspective provide financial as well as non- financial assessments.
F_holm odBSC HRS	Fact	Model	IS COMPOSED OF	<holistic model> IS COMPOSED OF <Balanced Scorecard> AND <HR Scorecard> AND <Skandia Navigator> AND <HCM> AND <Intangibles Scoreboard> AND <Value Chain Blueprint> AND <HVA> AND <IC- dVal> AND <HRA>	The models of the Holistic Perspective comprise the Balanced Scorecard, the HR Scorecard, the Skandia Navigator, the HCM, the Intangibles Scoreboard, the Value Chain Blueprint, the HVA, the IC-dVal, and the HRA.
F_HRS mod	Fact	Model	USES	<HR Scorecard> USES <human capital>	The HR Scorecard solely utilizes human capital for its assessment.
T_HCM	Term	Model	IS DEFINED AS	<HCM> IS DEFINED AS <the Human Capital Monitor>	Definition of the term "HCM"
F_HCM HAW	Fact	Model	IS EQUAL TO	<HCM> IS EQUAL TO <Human Asset Worth>	The HCM is also named Human Asset Worth.
F_HCM mod	Fact	Model	USES	<HCM> USES <human capital>	The Human Capital Monitor solely utilizes human capital for its assessment.
Rule ID	Type of Rule	Business Object	Priority	Rule	Definition

Table 9.1 (continued)

Rule ID	Type of Rule	Business Object	Priority	Rule	Definition
T_HVA	Term	Model	IS DEFINED AS	<HVA> IS DEFINED AS <the Holistic Value Approach>	Definition of the term "HVA"
F_HVA mod	Fact	Model	USES	<HVA> USES <classic model>	The Holistic Value Approach utilizes the classic model for classifying intellectual capital.
T_IC-dVal	Term	Model	IS DEFINED AS	<IC-dVal> IS DEFINED AS <the Intellectual Capital Dynamic Value>	Definition of the term "IC-dVal"
T_HRA	Term	Model	IS DEFINED AS	<HRA> IS DEFINED AS <the Human Resource Accounting>	Definition of the term "HRA"
F_HRA mod	Fact	Model	USES	<HRA> USES <human capital>	The Human Resource Accounting solely utilizes human capital for its assessment.
Rule ID	Type of Rule	Business Object	Priority	Rule	Definition

Table 9.1 (continued)

Rule ID	Type of Rule	Business Object	Priority	Rule	Definition
F_RDG ARCIC RB	Fact	Report	IS COMPOSED OF	<report> IS COMPOSED OF <Danish "Guideline for Intellectual Capital Statements"> AND <ARC- Wissensbilanz> AND <Human Capital Profit and Loss Statement> AND <Intellectual Capital Statement – Made in Germany> AND <ICRB> AND <WBV 2010>	Reports comprise the Danish "Guideline for Intellectual Capital Statements", the ARC- Wissensbilanz, the Human Capital Profit and Loss Statement, the Intellectual Capital Statement – Made in Germany, the ICRB and the WBV 2010.
F_DGass	Fact	Model	USES	<Danish "Guideline for Intellectual Capital Statements"> USES <financial assessment> AND <non-financial assessment>	The Danish "Guideline for Intellectual Capital Statements" provides a financial as well as a non- financial assessment.
F_ARC ass	Fact	Model	USES	<ARC- Wissensbilanz> USES <financial assessment> AND <non-financial assessment>	The ARC- Wissensbilanz provides a financial as well as a non- financial assessment.
Rule ID	Type of Rule	Business Object	Priority	Rule	Definition

Table 9.1 (continued)

Rule ID	Type of Rule	Business Object	Priority	Rule	Definition
G_SMB reiARC	Guideline	Model	SHOULD USE	IF <SMB> IS <research institution> THEN <SMB> SHOULD USE <ARC- Wissensbilanz>	The ARC- Wissensbilanz was primarily developed for the implementation in research institutions and should therefore be applied there.
F_ARC mod	Fact	Model	USES	<ARC- Wissensbilanz> USES <classic model>	The ARC- Wissensbilanz utilizes the classic model for classifying intellectual capital.
F_HCS ass	Fact	Model	USES	<Human Capital Profit and Loss Statement> USES <financial assessment>	The Human Capital Profit and Loss Statement provides a financial assessment.
F_HCS mod	Fact	Model	USES	<Human Capital Profit and Loss Statement> USES <human capital>	The Human Capital Profit and Loss Statement solely utilizes human capital for its assessment.
F_SMG ass	Fact	Model	USES	<Intellectual Capital Statement – Made in Germany> USES <financial assessment> AND <non-financial assessment>	The “Intellectual Capital Statement – Made in Germany” provides a financial as well as a non- financial assessment.
Rule ID	Type of Rule	Business Object	Priority	Rule	Definition

Table 9.1 (continued)

Rule ID	Type of Rule	Business Object	Priority	Rule	Definition
F_SMG mod	Fact	Model	USES	<Intellectual Capital Statement – Made in Germany> USES <classic model>	The “Intellectual Capital Statement – Made in Germany” utilizes the classic model for classifying intellectual capital.
T_ICRB	Term	Model	IS DEFINED AS	<ICRB> IS DEFINED AS <the Intellectual Capital Report Benchmarking>	Definition of the term “ICRB”
F_ICRB ass	Fact	Model	USES	<ICRB> USES <financial assessment> AND <non-financial assessment>	The Intellectual Capital Report Benchmarking provides a financial as well as a non-financial assessment.
F_ICRB mod	Fact	Model	USES	<ICRB> USES <classic model>	The Intellectual Capital Report Benchmarking utilizes the classic model for classifying intellectual capital.
F_HCS mod	Fact	Model	USES	<Human Capital Profit and Loss Statement> USES <human capital>	The Human Capital Profit and Loss Statement solely utilizes human capital for its assessment.
Rule ID	Type of Rule	Business Object	Priority	Rule	Definition

Table 9.1 (continued)

Rule ID	Type of Rule	Business Object	Priority	Rule	Definition
F_SMG ass	Fact	Model	USES	<Intellectual Capital Statement – Made in Germany> USES <financial assessment> AND <non-financial assessment>	The “Intellectual Capital Statement – Made in Germany” provides a financial as well as a non-financial assessment.
F_SMG mod	Fact	Model	USES	<Intellectual Capital Statement – Made in Germany> USES <classic model>	The “Intellectual Capital Statement – Made in Germany” utilizes the classic model for classifying intellectual capital.
T_ICRB	Term	Model	IS DEFINED AS	<ICRB> IS DEFINED AS <the Intellectual Capital Report Benchmarking>	Definition of the term “ICRB”
F_ICRB ass	Fact	Model	USES	<ICRB> USES <financial assessment> AND <non-financial assessment>	The Intellectual Capital Report Benchmarking provides a financial as well as a non-financial assessment.
F_ICRB mod	Fact	Model	USES	<ICRB> USES <classic model>	The Intellectual Capital Report Benchmarking utilizes the classic model for classifying intellectual capital.
T_WBV	Term	Model	IS DEFINED AS	<WBV 2010> IS DEFINED AS <the Wissensbilanz-Verordnung 2010>	Definition of the term “WBV 2010”
Rule ID	Type of Rule	Business Object	Priority	Rule	Definition

Table 9.1 (continued)

Rule ID	Type of Rule	Business Object	Priority	Rule	Definition
F_WBV ass	Fact	Model	USES	<WBV 2010> USES <financial assessment> AND <non-financial assessment>	The WBV 2010 provides a financial as well as a non- financial assessment.
G_SMB uniAus WBV	Guideline	Model	SHOULD USE	IF <SMB> IS <university> AND BASED IN <Austria> THEN <SMB> SHOULD USE <WBV 2010>	The WBV 2010 was primarily developed for the implementation in Austrian universities and should therefore be applied there.
F_WBV mod	Fact	Model	USES	<WBV 2010> USES <classic model>	The Wissensbilanz- Verordnung 2010 utilizes the classic model for classifying intellectual capital.
Rule ID	Type of Rule	Business Object	Priority	Rule	Definition

Table 9.1 (continued)

With the design of these over 150 rules the aim of this thesis' approach is achieved, namely the basic design of the targeted control system. These rules can now be used as the prime foundation for the implementation of the control system in practice.



9.2 A Practical Example for the Implementation of the Control System

When the control system is implemented and applied in practice within a company, all the business rules are executed to receive results based on the organization's characteristics and inputs.

Exemplarily, the business rules are applied in the following to an invented company to show how the basic implementation of the control system happens in practice. For this purpose,

the fictitious company "AlphaOne Investments" is used, which is invented solely for this thesis. "AlphaOne Investments" is a business which is based in Graz, Austria and operates in the financial services sector. Its legal form of ownership is the general partnership with two partners. The company currently employs 43 people and generated an annual turnover of 8.3 million Euros in the previous year. This firm is neither listed at the stock exchange nor does it hold any foreign financial assets. As its main business is the financial services, it is assumed to be a knowledge-intensive company.

Regarding the business rules of the control system, it is in the following only focused on some of the rule types introduced earlier while others are disregarded at this point to avoid repetition. Those kinds of rules which are considered here comprise the ones which basically impose some kind of obligation or propose some recommendation if the rule's requirements are met by the organization's characteristics. Examples for these types of business rules would be the ones of "Inferred knowledge" or "Action enabler". Other rule types, for instance "Terms" or "Facts", are omitted here as they are predetermined and the company's characteristics do not have an influence on them. The regarded rules in this context are displayed in Table 9.2.

Rule ID	Type of Rule	Rule	Validity
I_comUSAhivSMB	Inferred knowledge	IF <company> IS BASED IN <USA> AND <employees> < <500> AND IS <exporting service firm with high value> AND <annual revenue> <= <\$25 million> THEN <company> IS <SMB>	No
I_comUSAIowSMB	Inferred knowledge	IF <company> IS BASED IN <USA> AND <employees> < <500> AND IS <exporting service firm without high value> and <annual revenue> <= <\$7 million> THEN <company> IS <SMB>	No
I_comUSAffarmSMB	Inferred knowledge	IF <company> IS BASED IN <USA> AND <employees> < <500> AND IS <farm> and <annual revenue> <= <\$250,000> THEN <company> IS <SMB>	No
I_comEUSMB	Inferred knowledge	IF <company> IS BASED IN <EU> AND <employees> < <250> AND [<annual turnover> <= <€50 million> OR <balance sheet total> <= <€43 million>] THEN <company> IS <SMB>	Yes
G_SMBOECD	Guideline	<SMB> SHOULD OBEY <OECD>	Yes
A_SMBEUIFRS	Action enabler	IF <SMB> IS BASED IN <EU> THEN <SMB> SHOULD OBEY <IFRS>	Yes
A_SMBEUSEIFRS	Action enabler	IF <SMB> IS BASED IN <EU> AND IS LISTED AT <SE> AND <SE> IS BASED IN <EU> THEN <SMB> MUST OBEY <IFRS>	No
A_SMBEUinsrei	Action enabler	IF <SMB> IS BASED IN <EU> AND OPERATES IN <insurance and reinsurance businesses> THEN <SMB> MUST OBEY <SOLVENCY I>	No
A_SMBEEAinvbuss	Action enabler	IF <SMB> IS BASED IN <EEA> AND OPERATES IN <investment business> THEN <SMB> MUST OBEY <MiFID>	Yes
Rule ID	Type of Rule	Rule	Validity

Table 9.2: Valid rules for the fictitious "AlphaOne Investments"

Rule ID	Type of Rule	Rule	Validity
A_SMBEUE SOX	Action enabler	IF <SMB> IS BASED IN <EU> THEN <SMB> MUST OBEY <EuroSOX>	Yes
A_SMBUSS E	Action enabler	IF <SMB> IS LISTED AT <SE> BASED IN <USA> THEN <SMB> MUST OBEY <SOX> AND <US GAAP>	No
A_SMBUSA heaind	Action enabler	IF <SMB> IS BASED IN <USA> AND OPERATES IN <health industry> THEN <SMB> MUST OBEY <HIPAA>	No
A_SMBbans ec	Action enabler	IF <SMB> OPERATES IN <financial services sector> AND HOLDS <foreign financial asset> THEN <SMB> MUST OBEY <FATCA>	No
G_SMBban sec	Guideline	IF <SMB> OPERATES IN <financial services sector> THEN <SMB> SHOULD OBEY <BASEL II>	Yes
A_SMBPMV SE	Action enabler	IF <SMB> < IS LISTED AT <Prime Market> OF <VSE> THEN <SMB> MUST OBEY <ACCG>	No
A_SMBGer	Action enabler	IF <SMB> IS BASED IN <Germany> THEN <SMB> MUST OBEY <KonTraG>	No
G_SMBCOS O	Guideline	<SMB> MIGHT OBEY <COSO>	Yes
G_SMBCOB IT	Guideline	<SMB> MIGHT OBEY <COBIT>	Yes
A_SMBSE	Action enabler	IF <SMB> IS LISTED AT <SE> THEN <SMB> MUST OBEY <LSSE> OF <SE>	No
M_marmod SMBSE	Mandatory constraint	IF <SMB> USES <market model> THEN <SMB> MUST BE LISTED AT <SE>	No
M_SV	Mandatory constraint	IF <SMB> USES <Shareholder Value> THEN <SMB> MUST BE LISTED AT <SE>	No
G_SMBkic WTK	Guideline	IF <SMB> IS <knowledge-intensive company> THEN <SMB> SHOULD USE <Weightless Wealth Tool Kit>	Yes
G_SMBreiA RC	Guideline	IF <SMB> IS <research institution> THEN <SMB> SHOULD USE <ARC-Wissensbilanz>	No
G_SMBuniA usWBV	Guideline	IF <SMB> IS <university> AND BASED IN <Austria> THEN <SMB> SHOULD USE <WBV 2010>	No
Rule ID	Type of Rule	Rule	Validity

Table 9.2 (continued)

Out of these considered rules for "AlphaOne Investments" the ones which are applicable to the company are relevant for the further implementation of intellectual capital reporting on the basis of compliance. These "valid" ones are the ones where a "Yes" is found in the "Validity" column of Table 9.1. The rule "I_comEUSMB", for instance, clearly defines that "AlphaOne Investments" is a small and medium-sized business as it employees 43 – so less than 250 – people and generated an annual turnover of 8.3 million Euros – so less than 50 million Euros. Other rules oblige the firm to comply with the MiFID – like "A_SMBEEAinvbus" because "AlphaOne Investments" is an investment business and operates in the EEA –, or with EuroSOX – due to the fact that the company is based in the European Union. Still other rules recommend the obedience to the OECD Principles of Corporate Governance or to the IFRS; the latter as "AlphaOne Investments" is an SMB. Similarly, the rule "G_SMBkicWTK" advises the use of the "Weightless Wealth Tool Kit" for the intellectual capital measuring as the business is regarded as a knowledge-intensive

company. Depending on which approach(-es) is/are opted to utilize in the firm, the other rules regarding the IC measuring and reporting are only passed through or also applied.

Chapter 10

Summary, Conclusion & Risks

Since the 1990s at the latest, knowledge management and the identification, measuring and reporting of intellectual capital has been a hot topic. It has become a serious matter of business and becomes even increasingly important to every company and organization. Moreover, as Thomas A. Stewart puts it: "[...] most companies seem to have changed from a smug, knowledge-hoarding mentality to one of knowledge sharing."³⁷⁹ "Best-practices sharing, along with intellectual-capital theory [...], made knowledge management happen."³⁸⁰

The foundations for intellectual capital reporting were already built early, besides deep investigations on the subject knowledge management and its components on the whole. Dieter Herbst³⁸¹, for instance, delivers a sound insight into the terms "knowledge" and "knowledge management" and their characteristics and benefits if applied in a company; he also gives some examples out of practice. Furthermore, he explains the necessary processes connected to knowledge, ranging from recognizing knowledge to dispersing and measuring it. Rüdiger Reinhardt³⁸² elaborated the term "knowledge" and its management in high detail as well. He therefore compared various approaches on definitions and measurement methods from an economic, a management and an integrative perspective. Alistair Mutch³⁸³ moreover treated how data, information and knowledge are defined and differ from each other, and how these are used in management and work organizations; this he did in the context of information literacy and with a focus on the usefulness of Information and Communication Technology (ICT).

³⁷⁹Stew03, p. 328.

³⁸⁰Stew03, p. 328.

³⁸¹Cf. Herb00.

³⁸²Cf. Rein02.

³⁸³Cf. Mutc08.

Thomas A. Stewart³⁸⁴ pioneered the subject of intellectual capital, who named human, structural and customer capital as the foundation pillars of knowledge management, which is quite similar to Karl-Erik Sveiby's competences of people, and internal and external structure³⁸⁵. This basis has stayed the same while the surrounding technology, and the techniques and methods to measure, record and evaluate information and knowledge have changed swiftly over time. In this context, Jeffrey A. Cohen did his work basically on the identification of intellectual capital, "[...] the economic benefit that can be derived [from it] and the degree of ownership or control that a firm has over the intangible asset."³⁸⁶ Besides presenting and summarizing calculation approaches for intellectual capital, he introduces uncommon – or even not considered – kinds of intangibles: so-called ephemeral assets. He calls them the "'really' intangible assets"³⁸⁷ which for him are personality traits like charisma, beauty or power.

Wilhelm Schmeisser and Martina Lukowsky state that there are already some feasible approaches on intellectual capital (especially human capital) management and reporting existent, which "[...] help to achieve a change in minds, meaning that employees are considered as value creating resources and not as mere cost factors".³⁸⁸

A good overview of some prominent examples of intangibles valuation is given by Daniel Andriessen³⁸⁹, who himself elaborated the "Weightless Wealth Toolkit". Andrew Mayo³⁹⁰ is another author dedicated to finding new business models and measurement methods on intangible assets, designing the "Human Capital Monitor". Besides others, the most prominent example on a model for measuring intangibles is the "Balanced Scorecard" by Robert S. Kaplan and David P. Norton.³⁹¹ Other ones would be the "Intangible Assets Monitor" from Karl Erik Sveiby³⁹², the "Skandia Navigator", elaborated at the homonymous insurance group by Leif Edvinsson and Michael S. Malone³⁹³, or the "Human Resources Scorecard" by Brian E. Becker, Mark A. Huselid and Dave Ulrich³⁹⁴.

Regarding the approaches on intellectual capital reporting there should be named the "Intel-

³⁸⁴Cf. Stew97, Stew03.

³⁸⁵Cf. Svei97, Svei98.

³⁸⁶Cohe05, p. 10.

³⁸⁷Cohe05, p. 135.

³⁸⁸ScLu06, p. 99.

³⁸⁹Cf. Andr04a.

³⁹⁰Cf. Mayo03.

³⁹¹Cf. KaNo96.

³⁹²Cf. Svei97.

³⁹³Cf. EdBr00.

³⁹⁴Cf. BeHu01, HuBe05

lectual Capital Statement – Made in Germany" with its supporting software, the "Wissensbilanz-Toolbox", published by the German Federal Ministry of Economics and Labour³⁹⁵.

Not only the conception of staff has changed considerably since the spread of knowledge management and intellectual capital measuring and reporting, also the understanding of the term company itself is different today. Stewart predicts that "[k]nowledge companies will [...] have to learn to think of themselves almost in biological terms, rather than in mechanical ones."³⁹⁶ "Organizations are complex human systems. They can adapt, grow, and improve the way human beings do [...]. Organizations are not so much collections of parts as they are connections of brain cells, nerves, and sinews."³⁹⁷

Concerning the subject of compliance, various standards and laws are in place to which companies – depending on the regulations' requirements – have to obey to. One of these regulations is the Sarbanes-Oxley Act of 2002 with its – for organizations – most far-reaching sections 302 "Corporate responsibility for financial reports" and 404 "Management Assessment of Internal Controls".³⁹⁸

A great number of experts are engaging in the subject of compliance. One of these is Christof Menzies who for instance addresses especially the topic of "internal control mechanisms", obligatory for companies due to SOX³⁹⁹. Furthermore, the author gives comprehensive suggestions concerning the implementation of regulations on compliance.⁴⁰⁰ Other experts devoted to this topic are Terence Sheppey and Ross McGill⁴⁰¹ who review SOX in high detail and especially engage in practical compliance, obeying not only to the Sarbanes-Oxley Act but also regarding, for example, the COSO and COBIT frameworks for compliance.

Furthermore, Martin Scholich, financial and tax adviser and board member at PwC, predicts: "In the future, securing compliance will even more evolve into a strategic factor of success for companies. Corporate governance that is sustained, risk- and value-oriented, ethical and compliant to rules will then not only become a criterion of quality and of differentiation from investors' view. The target-oriented handling of stakeholders' expectations and the compliance to requirements will rather become an inherent part of top business

³⁹⁵Cf. AlBo04, RuWi07.

³⁹⁶Cf. Stew03, p. 335.

³⁹⁷Stew03, p. 336.

³⁹⁸Cf. Menz04, p. 353.

³⁹⁹Cf. Menz04.

⁴⁰⁰Cf. Menz06.

⁴⁰¹Cf. ShMc07.

objectives."⁴⁰²

So, both intellectual capital measuring and reporting as well as compliance management are considered of high importance nowadays for business success by industry experts and the industry itself. Considering the one in combination with the other allows for a holistic management of both domains plus enables understanding as well as handling the existing correlations.

The final objective of this thesis was – as already explained in high detail in chapter 3.2 – to pass through and to complete the process of designing a control system for implementing intellectual capital measuring and reporting on the basis of compliance; this was done especially for small and medium-sized businesses. After defining important vocabulary for this purpose, the process began with its first stage called "data & information". This meant introducing and afterwards comparing models on IC measuring and reporting as well as regulations on compliance. The intention behind this was to find the fundamental criteria for setting up the control system. Furthermore, the second stage dealt with deciding on and explaining the "technology" the control system is built upon: for this purpose business rules were used. Then the third stage named "rules" continued with designing these business rules, whose content and composition are directly influenced by the results of the previous stages. Barbara von Halle's "Business Rules Applied" provides the ideal foundation for the basic design of the control system, namely the business rules within it. Moreover, a small practical example was presented to show the application of the control system to a single company. Based on the conducted analysis of models on intangibles' measuring and reporting and of the regulations on compliance as well as on the designing of the rules, some further thoughts on the necessary requirements for a successful implementation of the business rules system arise, namely:

- realizing the necessity for an intellectual capital management and reporting based on compliance within the SMB,
- Top management has to support the implementation to its full extent and executives have to act as role models,

⁴⁰²German original, translated by the author; cf. Menz06, p. VIII: "Zukünftig wird sich die Sicherstellung von Compliance noch stärker als bisher zu einem strategischen Erfolgsfaktor für das Unternehmen entwickeln. Eine nachhaltige, risiko- und wertorientierte, ethische und regelkonforme Unternehmensführung wird dann nicht nur zu einem Qualitäts- und Differenzierungskriterium aus Sicht der Anleger. Der zielgerichtete Umgang mit Stakeholder-Erwartungen und die Erfüllung der Anforderungen werden vielmehr zu einem festen Bestandteil der obersten Unternehmensziele."

- determining the final aim of the implementation,
- clarifying who is responsible for the implementation and who are the contributors,
- implementing the system,
- testing the system's operability and
- inspecting the intellectual capital management and compliance management regularly for errors and necessary updates.

Finally concluding, some far-reaching challenges the control system – and also the two disciplines of intellectual capital measuring and reporting as well as compliance management individually – has to face in the future are to be quoted. Schmeisser and Lukowsky, for instance, see "[...] ethical concerns [regarding intellectual capital reports] because of the danger that employees are reduced to production factors, like material assets".⁴⁰³ This argument endangers the quality as well as quantity of published intellectual capital statements.

Furthermore, Thomas A. Stewart spots some intellectual risks existent in companies: "Your reputation or brand. [...] Your business model. [...] Your intellectual property. Many risks to intellectual property – theft, for example – can be dealt with in obvious [...] ways. [...] Your network. [...] Your human capital. [...] flight [...] [,] [...] "empowerment risk" [...]"⁴⁰⁴ "Notice a couple of patterns in this list of intellectual risks. First, an ever-greater portion of risk comes from sources a company can't own – people, partners, environments. Second, volatility isn't just a currency or stock-market risk anymore. Labor markets, technologies, even business models oscillate at higher frequencies – their behavior more and more resembling that of financial markets."⁴⁰⁵ The argument Stewart already advanced in 2003 still is up-to-date now. With the help of compliance management, intellectual capital measuring and reporting has a foundation as well as the authority of being implemented and managed properly. The regulations on compliance oblige businesses to amplify their annual reports by intellectual capital aspects plus provide guidance on what kind of information to release. With this aid, together with the usage of models and reports on the intangibles assessment and reporting, a comprehensive holistic statement on company performance is possible.

⁴⁰³ScLu06, p. 100.

⁴⁰⁴Stew03, pp. 226-228.

⁴⁰⁵Stew03, pp. 228-229.

*"Though your balance-sheet's a model of what a balance-sheet should be,
Typed and ruled with great precision in a type that all can see;
Though the grouping of the assets is commendable and clear,
And the details which are given more than usually appear;
Though investments have been valued at the sale price of the day,
And the auditor's certificate shows everything O.K.;
One asset is omitted – and its worth I want to know,
The asset is the value of the men who run the show."
Archibald Bowman, 1938⁴⁰⁶*

⁴⁰⁶Mayo03, p. 1.

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Appendix A: Intellectual Capital Indicators of the AIT

The following Table 10.1 is an extract of the intellectual capital indicators 2010 of the Austrian Institute of Technology (AIT). It gives the indicators for human, structural, and relationship capital, plus a definition of them. The Austrian Institute of Technology released it as an update to their intellectual capital report from 2009 which can be found on <http://www.ait.ac.at/presse/wissensbilanz/>, Access: 2012-05-30.

Intellectual Capital Indicators	2009	2010
Human Resources		
Number of employees (full-time equivalents = FTEs)	678,3	649,4
Number of employees (headcount)	716	687
Number of researchers (headcount)	439	427
Proportion of research staff (% headcount)	61,3	62,2
New employees hired - total (FTE)	81,5	71,2
New research staff (FTE)	60,4	52
Total employees departing (FTE)	80	103,7
Total research staff departing (FTE)	39	65,4
Total retirements	17	7
Percentage of female employees (%)	23,3	24,1
Percentage of female research staff (%)	14,3	14,8

Table 10.1: Extract of AIT's Intellectual Capital Indicators 2010⁴⁰⁷

⁴⁰⁷Cf. AIT11, pp. 1+3.

Intellectual Capital Indicators (continued)	2009	2010
Women in senior positions (%)	21,7	23,3
Women on supervisory and advisory boards (%)	23	22,6
Training		
Total training days per employee	5	4,4
Structural Capital		
Processes and equipment		
Capital investment (% of operating revenues)	9,5	5,9
Capital investment in large research equipment (> 70.000 Euro) in '000 EUR	2.344	2.625
Floor space (m2)	72.856	72.856
thereof laboratory space (m2)	5.257	5.257
Relational Capital		
Project cooperation		
Number of international researchers	111	103
Number of lectures	93	89
Number of PhD students	114	103
Number of international PhD students	32	29
Number of diploma students	74	61
Employees with postdoctoral lecture qualification	19	20

Table 10.1 (continued)

Definition of Indicators

2009

Intellectual Capital Indicators

Human Resources

Number of employees (full-time equivalents = FTEs)	Full-time equivalent staff – not including trainees, staff on unpaid leave, completing military service, on parental leave in the period under review
Number of employees (headcount)	Number of staff – not including trainees, staff on unpaid leave, completing military service, on parental leave
Number of researchers (headcount)	Number of staff with university degrees, excluding graduates with administrative responsibilities in the period under review
Proportion of research staff (% headcount)	Number of researchers (headcount) / number of staff (headcount)
New employees hired - total (FTE)	Number of new employees (full-time equivalents) joining the AIT in the period under review
New research staff (FTE)	Number of new researchers (full-time equivalents) joining the AIT in the period under review
Total employees departing (FTE)	Total number of staff who left the AIT during the period under review
Total research staff departing (FTE)	Number of researchers leaving the employ of the AIT during the period under review
Total retirements	Number of employees who retired during the period under review
Percentage of female employees (%)	Full-time equivalent female staff/full-time equivalents of all staff
Percentage of female research staff (%)	Full-time equivalent women research staff / full-time equivalents of all research staff
Women in senior positions (%)	Number of women in senior positions / total number of senior positions. Senior positions are defined as managers, authorized signatories, department heads and heads of business units. Only one position is counted if several positions are held simultaneously or within the same period
Women on supervisory and advisory boards (%)	Number of women on supervisory and advisory boards /total number of supervisory and advisory board members

Table 10.1 (continued)

Definition of Indicators (continued)

Training

Total training days per employee Number of training days excluding attendance at conferences and seminars per employee (full-time equivalent)

Structural Capital

Processes and equipment

Capital investment (% of operating revenues) Assets acquired excluding buildings and technical infrastructure (incl. IT infrastructure) / total operating revenues

Capital investment in large research equipment (> 70.000 Euro) in '000 EUR Research equipment larger than 70.000 Euro acquired in the year under review (in '000 EUR)

Floor space (m2) Entire AIT area (m2)

thereof laboratory space (m2) Laboratory space as part of the entire AIT areal

Relational Capital

Project cooperation

Number of international researchers Number of AIT researchers of nationalities other than Austrian

Number of lectures Number of lectures held at universities, technical colleges or postgraduate educational institutions and listed in the university or college catalogue. The period of review is of review is the academic year, i.e. winter semester and the following summer semester

Number of PhD students Number of individuals working on doctoral theses at AIT in the period under review, i.e. supervised by AIT staff – regardless of grants and including AIT staff working on theses

Number of international PhD students Number of individuals of nationalities other than Austrian working on doctoral theses at AIT in the period under review

Table 10.1 (continued)

Definition of Indicators (continued)

Number of diploma students Number of individuals working on diploma theses at AIT in the period under review – regardless of grants and including AIT staff working on diploma theses

Employees with postdoctoral lecture qualification Number of employees with postdoctoral lecture qualification

Table 10.1 (continued)

Appendix B: Zusammenfassung

Wegen der Vielzahl an öffentlich bekannt gewordenen Unternehmensskandalen in den vergangenen Jahren sowie aufgrund der Weltfinanzkrise hat Compliance sehr an Wichtigkeit gewonnen. Etliche Compliance-Regelungen sind infolge dessen entwickelt und umgesetzt worden, und bereits in Kraft gewesene wurden aktualisiert und erweitert, um sie an das neue wirtschaftliche Umfeld anzupassen. Aufgrund dieser sich verändernden Umstände ist das Compliance-Management unerlässlich für jeden Betrieb geworden.

Andere Themen von immer größer werdender Bedeutung sind die Messung und die Berichterstattung von Wissenskapital. In diesem Zusammenhang spielen die Identifizierung und die Bewertung von intellektuellen Vermögenswerten eine zentrale Rolle; diese sind mittlerweile wesentlich für Investitionsentscheidungen oder für Veröffentlichungen von Betriebsinformationen gemäß geltender Regelungen.

Heutzutage sollte ein Wissenskapitalbericht standardmäßig den Finanzbericht eines Unternehmens ergänzen, um eine ganzheitliche Darstellung von Betriebsinformationen für die Interesseneigner zu ermöglichen; dieser Wissenskapitalbericht muss im Einklang mit gültigen Gesetzen erstellt und veröffentlicht werden. Diese Diplomarbeit basiert also wesentlich auf den zwei Themen der Wissenskapitalmessung und -berichterstattung und dem Compliance-Management. Um ein fundiertes Verständnis dieser Themen zu vermitteln, werden die grundlegenden Begriffe, die diese ausmachen, zu Anfang definiert und erklärt.

Ziel und Herausforderung dieser Diplomarbeit sind nun, ein Kontrollsystem für die gemeinsame Einführung von Compliance und Wissenskapitalmessung und -berichterstattung zu entwickeln, um eine ganzheitliche Bewertung und Darstellung der unternehmerischen (Wissens-)Vermögenswerte möglich zu machen. Das wird erreicht durch Auswertung einer repräsentativen Zahl von gültigen Compliance-Verordnungen sowie einiger Modelle für die Bewertung und die Berichterstattung von intellektuellem Kapital. Die Ergebnisse dieser Analysen dienen anschließend als Grundlage für die Ausgestaltung des Kontrollsystems für die praktische Anwendung; dabei zur Anwendung gelangen Geschäftsregeln.

Appendix C: Executive Summary

Because of the great number of corporate scandals which became publicly known over the last years as well as due to the global financial crisis, compliance has gained very much in importance. In response, various regulations on compliance have been developed and implemented since, and already in force laws were updated and enhanced to be adapted to the new economic environment. Owing to these changing circumstances compliance management has become indispensable for every business.

Other topics of increasing significance are the ones of intellectual capital measuring and reporting. In this context, the identification and the measurement of intellectual assets play a central role; by now, these are crucial concerning investment decisions or for publishing company information in compliance with valid regulations.

Nowadays, an intellectual capital statement should supplement an enterprise's financial report by default to allow for a holistic presentation of stakeholder-relevant company information; this intellectual capital statement again has to be compiled and released in accordance with in force regulations. So this thesis substantially bases on the two issues of intellectual capital measuring and reporting, and compliance management. To provide a profound understanding of these subjects, the vital terms constituting these are defined and explained in the beginning.

The overall objective and challenge of this thesis is now to develop a control system for the joint implementation of compliance and intellectual capital measuring and reporting to make the holistic assessment and presentation of the company's (knowledge) assets possible. This is achieved by evaluating a representative number of valid regulations on compliance as well as several models on measuring and reporting intellectual capital. The findings of these analyses then serve as foundation for the design of the control system for the implementation; thereby business rules are applied.

Appendix D: Curriculum Vitae

Personal data

Name	Johanna RAKOVSKY
Date and place of birth	1984/05/26, Mödling
Nationality	Austria
Marital status	Single, one child (2012/02/15)

Education

2004/10 – present	Study of International Business Administration, University of Vienna; special subjects of Business Informatics and Corporate Finance
2002/10 – 2004/06	Study of Architecture, Vienna University of Technology
1994/09 – 2002/06	Bundesgymnasium Babenbergerring, Wiener Neustadt; tuition with focus on informatics; school leaving examination (A-levels) in 2002/06
1990/09 – 1994/06	Privatvolksschule Santa Christiana, Wiener Neustadt

Professional experience

2011/12 – present	Maternity leave
2010/09 – present	Shopwoman, Backhaus Annamühle, Baden
2008/03 – 2008/06	Supporting function in the project "Open Models: A Feasibility Study", Department of Knowledge and Business Engineering, University of Vienna

2007/07 – 2007/09	Internship in the Customer Service Management Team of Group IT Operations, Zurich Financial Services, Schlieren (Switzerland)
2007/02	Practical work experience, Vienna Insurance Group, Vienna
2006/09	Practical work experience, Vienna Insurance Group, Vienna
2006/08	Holiday job, Interspar, Wiener Neustadt
2006/New Year's Eve	Seller of lucky charms, Blaschek Import, Wiener Neustadt
2005/07 – 2005/08	Holiday job, Interspar, Wiener Neustadt
2005/New Year's Eve	Seller of lucky charms, Blaschek Import, Wiener Neustadt
2004/07 – 2004/08	Holiday job, Interspar, Wiener Neustadt
2004/New Year's Eve	Seller of lucky charms, Blaschek Import, Wiener Neustadt

Language skills

German	Native
English	Excellent
Spanish	Proficient
French	Basic