

INTELLECTUAL CAPITAL IN HOSPITALS - OPPORTUNITIES AND LIMITATIONS OF EXTERNAL INTELLECTUAL CAPITAL REPORTING

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DECLARATION IN LIEU OF OATH

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List of abbreviations

AMD	Accounts Modernisation Directive
APICC	Asia Pacific Intellectual Capital Centre
ASCG	Accounting Standards Committee of Germany
DCF	Discounted cash flow
DRG	Diagnosis related groups
EFFAS	European Federation of Financial Analysts Societies
GAS 20	German Accounting Standard 20
GMR	Group management report
GSG	Gesundheitsstrukturgesetz - Health Care Structure Act
IC	Intellectual capital
IDW	Institut der Wirtschaftsprüfer in Deutschland e.V. - Institute of Public Auditors in Germany, Incorporated Association
KHG	Krankenhausfinanzierungsgesetz - Hospital Financing Act
KPI	Key performance indicators
OECD	Organisation for Economic Co-operation and Development
SGB 5	Sozialgesetzbuch 5 - German Social Act No. 5
SME	Small and medium sized enterprise

1 Introduction

1.1 Problem description and importance of the topic

An increasingly complex, dynamic and competitive environment on the health care market, complemented with higher demands of different stakeholders and decreasing financial resources, forces hospitals, among other health care facilities, to search for competitive advantages, to act more economically and, where required, to look for external capital.

Organisational knowledge is the key point of a sustainable competitive advantage and this is the reason for the booming interest on intellectual capital in theory and practice (Bontis, 2001, p. 271). To gain strategic advantages there is the necessity to utilize the available knowledge. This is applicable for profit oriented organisations as well as for public or not-for-profit organisations (Kong, 2010, p. 98). There is an observable shift of the basis of competition from traditional tangible and financial resources like cash, machinery or buildings to intangible resources, which comprise people and their expertise, business processes or market assets (Bontis, 2001, p. 273). Already in the late 1980s it was stated that "[a] company's economic value is not merely the sum of the values of its tangible assets [...]. It also includes the value of intangible assets: the stock of innovative products, the knowledge of flexible and high-quality production processes, employee talent, and morals, customer loyalty and product awareness, reliable suppliers, efficient distribution networks and the like." (Johnson & Kaplan, 1987, p. 202)

Without replacing traditional factors of production, i.e. tangible assets, there is a central role assigned to knowledge as an intangible resource concerning the creation of new values and, in further consequence, maintaining the competitive position of an organisation.

Also in the healthcare sector, which is characterized as a highly knowledge-intensive industry, the potential to gain added-value through intellectual capital is constantly increasing (Leitner et al., 2001, p. 3) and consequently the importance of management of intellectual capital is growing (Peng et al., 2007, p. 539). Studies in hospitals have already shown a meaningful

relationship between intellectual capital and the performance of a hospital (Lai & Tsay, undated, p. 1; Rafiei et al., 2011, p. 3551).

Some hospitals in Germany already measure and display information on intellectual capital and therefore provide supplementary disclosure for their stakeholders to decrease a lack of information (Kimbrough, 2008, as cited in OECD, 2012, p. 102; Heiligenfeld GmbH, 2009, online). This can be especially important when hospitals have to cope with trends towards privatization and market consolidation (Augurzky et al., 2012a, online; Augurzky et al., 2012b, p. 11; Tiemann et al., 2011, p. 163) as well as towards the increasing need for external alternatives for investment funding (Dewulf & Wright, 2009, p. 123; Ziehe, 2009, p. 1).

Though Sveiby (1997) argued that instead of money new alternatives should be used to display effort made by humans, there is still the question arising, if reports using various non-monetary terms really show the added value and in further consequence the real economic value of the organisations, which is recognizable in enterprise valuations.

1.2 Research objectives and research questions

Growing competition among health care providers, the rising demand for transparency toward stakeholders and shareholders, as well as, the rising need for some hospitals to improve investments and operations build the basis for the following research questions (RQ):

RQ 1: How is intellectual capital measured and displayed in hospitals?

RQ 2: Are current intellectual capital valuation and reporting tools used in hospitals appropriately to display the added value by intellectual capital and its contribution to business success?

RQ 3: How can the disclosure of intellectual capital influence the enterprise value of a hospital and its valuation? Can a positive effect on external investments be generated?

1.3 Research approach and methodology

To solve the research problems systematically and answer the mentioned research questions two different methods are used. Firstly, an in-depth literature research, done by a select analysis of existing research builds a solid theoretical background for the present thesis. By surveying and describing relevant studies and existing expert opinions, as well as by summarizing the existing state of opinion and research on the topic, a fundament for the display of current intellectual capital disclosure tools shall be provided. Valuable sources to draw from are online databases which provide most recent scientific theoretical and empirical papers, but also show the history and development of the subject of intellectual capital and its valuation. Especially the databases of Emerald, Elsevier, and ScienceDirect, respectively "The Journal of Intellectual Capital", are used to identify the international state of the art in the investigated area. The particular emphasis of the review will be on important theoretical and empirical publications related to intellectual capital definition, measurement, management, reporting and influence on financial analysts. In order to get specific understanding about the current state of scientific knowledge in Germany, the publications and guidelines of "Arbeitskreis Wissensbilanz" (Consortium Intellectual Capital Statement¹), which deals with the topic in the field of small and medium sized enterprises, can be seen as an important source.

Secondly, an empirical approach will be followed. By use of content analysis of external available intellectual capital disclosure of national and international hospitals, the status quo shall be examined, and the questions, how information on intellectual capital can be disclosed and whether current intellectual capital reporting tools of hospitals reflect the added value gained by intellectual capital and the value creation of the enterprise, shall be answered. Furthermore, an examination on the appropriateness of intellectual capital reporting tools, in regard with the valuation of hospitals, will be conducted.

¹ The literal translation for "Wissensbilanz" would be knowledge balance sheet, but in fact intellectual capital statement is the more appropriate translation.

In the research field of intellectual capital reporting the method of content analysis is widely used (Guthrie et al., 2012, p. 75) (see for example studies from Abeysekera, 2011; Oliveira et al., 2010; Beattie & Thomson, 2007; Guthrie et al., 2004; and Guthrie, 2001).

"Content analysis is a technique for gathering data that consists of codifying qualitative information in anecdotal and literary form into categories in order to derive quantitative scales of varying levels of complexity." (Abbott & Mosen, 1979, p. 504) It has the purpose of a deduction of patterns from the published information by using a systematic, objective and reliable form of analysis (Krippendorff, 1980, p. 21). The determination of relevant categories, respectively indicators, is done based on an in-depth literature review. Derived from this, a disclosure index will be conducted to analyze the reports. A detailed description of the methodology is provided in chapter 5 and followed by a display of research results in chapter 6.

2 Genesis and description of the concept of "Intellectual Capital"

"In the knowledge economy, the value of countries, regions, organizations and individuals is directly related to their knowledge and intellectual capital (IC)". (Edvinsson & Bounfour, 2004, p. 55) The change from an industrial based to a knowledge based economy, and in further consequence the shift from the focus of tangible to intangible assets, has started in the 1980s (Guthrie et al., 2012, p. 68). Even though value creation through knowledge has its roots before 1990, the thoughts about manageability of knowledge and the term "Intellectual Capital" (IC) arose between 1991 and 1997 (Sveiby as cited in Barcelo, 2001, p. 11).

Leif Edvinsson can be seen as a precursor in the use and publication of non-financial ratios in an annual report as a supplement to the financial report for Skandia, the largest Scandinavian insurance and financial service company at that time. In 1995 he expressed it for the first time as "Intellectual Capital" instead of the accounting term "Intangible Assets". The aim of the integrated intellectual capital model was to illustrate that "the true value of a company's performance lies in its ability to create sustainable value by pursuing a business vision and its resulting strategy (Edvinsson & Malone, 1997, p. 17). This shows on the one hand, that the intellectual capital movement has its roots in practice instead of theory (Petty & Guthrie, 2000, p. 160). On the other hand, the clear dependence of performance and value creation on a vision, respectively a strategy is stated.

Since then the topic of intellectual capital and its measurability and manageability has raised interests on the side of practitioners and researchers (Marr & Chatzkel, 2004, p. 226) in different areas including economic, managerial, technological, and sociological fields (Petty & Guthrie, 2000, p. 157).

Guthrie et al. (2012) state that the concept of intellectual capital has undergone three stages up until now. Beginning in the early 1990s, the first stage was characterized with a focus on raising awareness on the importance to understand that IC is the main value driver in an organisation (Marr & Chatzkel, 2004, p. 225) and to recognize the potential of IC to be the creator

of sustainable competitive advantage of a firm. The basis for the creation of guidelines and standards was to make the "invisible visible" and comparable (Guthrie et al., 2012, p. 70). The common message of publications at this stage is that "intellectual capital is something significant and should be measured and reported" (Petty & Guthrie, 2000, p. 162).

The second stage is denoted by research of influence of IC on a micro-level (i.e. organisational level) and how the reaction of labour and capital markets on IC as potential value creator could be. In this stage the focus is on the process of measuring and managing already existing IC within an organisation from a top-down perspective (Guthrie et al., 2012, p. 70; Petty & Guthrie, 2000, p. 162).

The current, third, stage of intellectual capital started in 2004 and focuses on a critical review of IC in practice (Guthrie et al., 2012, p. 76).

There is no explicit point in time which distinguishes the first, the second and the third stage. It is rather the difference of focus or answered questions which is decisive. Attempts which answer the questions "why, what, and where" are rather part of the first stage, whereas efforts concentrating on the question "how" lead to the second one (Petty & Guthrie, 2000, p. 162). Though the first and the second stages contributed to a commonly accepted terminology of IC (Guthrie et al., 2012, p. 70), the debate about defining IC did not end with the beginning of the third stage. Marr & Chatzkel stated in 2004 (p. 226) that: "IC as a concept is often poorly defined, we therefore advise researchers and practitioners [to] clearly define the term at the outset whenever the term is used." Therefore, different definitions and a derived working definition will be displayed in the following chapter.

2.1 Definitions of "Intellectual Capital" and working definition

With the increase in popularity of the topic "intellectual capital", the amount of definitions also increased. Definitions are provided from early practitioners and key contributors like Leif Edvinsson or Karl-Erik Sveiby, followed by many important researchers in the field like Baruch Lev, Thomas Stewart, Patrick Sullivan (Sullivan, 2000, online), or Annie Brooking (1996). Furthermore, definitions are offered by national organisations including the German Arbeitskreis Wissensbilanz (Consortium Intellectual Capital Statement) (2004), and APICC (Asia Pacific Intellectual Capital Centre) (2008) as well as

by supranational projects or organisations like the European MERITUM project (2002), the EFFAS (European Federation of Financial Analysts Societies) (2008), and the OECD (Organisation for Economic Co-operation and Development) (2012). The diversity of members in the present field of interest and their different focus lead to a wide variety of definitions. When examining different definitions a few common characteristics are identifiable.

An early definition is provided by Sullivan (1998, p. 21), who states that intellectual capital is "knowledge that can be converted into profit", without specifying which kind of knowledge he means. More detailed is the definition of Edvinsson & Malone (1997, p. 44) who see intellectual capital at "the possession of knowledge, applied experience, organizational technology, customer relationships and professional skills that provide [a company] with a competitive edge in the market". A similar view shares Stewart (1997, online) who states that "Intellectual Capital is a guide to the strategic and practical issues of identifying, capturing, and using knowledge to improve a company's competitive advantage. [...] Intellectual capital is Intellectual material—knowledge, information, intellectual property, experience—that can be put to use to create wealth. [...]". The Arbeitskreis Wissensbilanz (2004, p. 8) sees in intellectual capital "[t]he existing knowledge of an organisation that is critical to success". The explicit use of "knowledge" as a source of a competitive advantage and a matter of success is shared in these definitions or descriptions.

In line with this but a step forward towards value creation goes the definition of McConnachie & Lung for the APICC (Asia Pacific Intellectual Capital Centre) (2008, p. 1) when defining intellectual capital as "all knowledge within an organisation which has the potential to create value when applied in line with the mission, vision and goals of the organisation. It refers to the intangible capital (i.e. other than financial capital) owned by companies". Marr and Schiuma (2001, as cited in Starovic & Marr, 2008, p. 6) state that: "Intellectual capital is the group of knowledge assets that are attributed to an organisation and most significantly contribute to an improved competitive position of this organisation by adding value to defined key stakeholders".

A common characteristic, beside the explicit use of knowledge and value creation, is that the organisation has the ownership of the knowledge. This is also shown in the definition of Pike et al. (2005, p. 494) who define intellectual

capital "as any intangible resources or transformations of those resources, which are under some level of control of the company that adds to a company's value creation". Again the advanced aspect of value creation is included in the definition. The difference to the previous definitions lies in the designation of any intangible resource instead of the explicit mentioning of knowledge. Consistent with this aspect as well as with the aspect of value creation is the definition of the European MERITUM project that defines the term „intangibles“ but stating that intangibles and intellectual capital represent similar concepts and are used indifferently. They see in intellectual capital "non-monetary sources of probable future economic profits, lacking physical substance, controlled (or at least influenced) by a firm as a result of previous events and transactions (self-production, purchase or any other type of acquisition) and may or may not be sold separately from other corporate assets." (MERITUM, 2002, p. 9)

Furthermore they explain that intellectual capital is seen as a combination of an organisation's human, organisational and relational resources and activities. It is embracing all kinds of intangibles, either formally owned or used, or informally deployed and mobilized (MERITUM, 2002, p. 11). The same terminology of components is used in the description provided after the definition used by the OECD (2012, p. 104) when expressing that intellectual capital is a "resource utilised in future value creation without a physical embodiment" and it includes proprietary knowledge, human capital, relational capital, and organisational capital. In the guidelines from Arbeitskreis Wissensbilanz there is the division made into human capital, structural capital and relational capital (2004, p. 44). Also Edvinsson & Malone (1997, p. 11) see the factors of human, structural and customer capital as parts of the overall concept of intellectual capital. However, they see a hierarchical relationship where structural capital includes relational capital. Important to bring up here is that they are of the opinion that only structural capital, and consequently relational capital, can be owned by the company, but not the human capital component of intellectual capital.

As shown above the mentioned elements of human, structural (or organisational) and relational capital are part of several descriptions of intellectual capital.

That is why a threefold classification of intellectual capital can be seen as commonly accepted, even though these components do not always have the same names (Guthrie et al., 2012, 70). For a better understanding the following table shows a description of what is understood as being under the three components.

Table 1: Components of intellectual capital

Human capital	<ul style="list-style-type: none">• Knowledge and know-how embedded in people• Human competencies and skills including education, reactive abilities and changeability• Innovativeness of employees• Motivation of employees• Experience of employees• Ability of individual employees to meet the task
Structural (organisational) capital	<ul style="list-style-type: none">• Knowledge embedded in the organisation and its systems• Infrastructure like information systems (hardware, software) and networking systems• Intellectual property like patents, copyrights and trademarks• Organisational culture• Routines/ processes/ standards• Unique organisational designs
Relational capital	<ul style="list-style-type: none">• Knowledge embedded in relationships to external stakeholders• Image of brands• Customer loyalty• Stakeholder satisfaction• Company names and reputation• Relation with the public

Source: Guthrie et al., 2012, p. 70; Petty & Guthrie 2000, p. 166, Marr, 2005, p. 471; Edvinsson & Malone, 1997, p. 11, Arbeitskreis Wissensbilanz, 2004, p. 8, Lev, 2001, p. 7

Of high importance to mention is the fact, that the value creation is only possible when the components of intellectual capital interact with each other and are aligned. Furthermore, the desired outcome is dependent on an equal distribution of the components because one very weak element can hardly be

compensated by two strong elements (Edvinsson & Malone, 1997, p. 145f). According to Lev (2001, p. 7) another aspect seems to be important when he states that "[i]ntangibles [and interchangeable intellectual capital] often interact with tangible and financial assets to create value and economic growth."

After a wide range of definitions and descriptions the following working definition is derived:

"Intellectual capital consists of non-physical (i.e. intangible) sources of knowledge used for value creation for key stakeholders related to the presence of human, structural and relational capital."

The terms "intellectual" capital and "intangibles" are used synonymously.

2.2 Relationship and distinction to associated terms

Lev (2001, p. 5ff) states that the terms "intangibles", "knowledge assets", and "intellectual capital" can be used interchangeably and they refer actually to the same thing. The difference is just to be found in the field of application, depending on whether the terms are used in the context of accounting (intangibles), related to economics (knowledge assets), or related to management and law (intellectual capital respectively intellectual property) but it is always a nonphysical source of value. A similar argumentation offers Dalkir (2011, p. 468) when he gives the explanation that "[i]ntangibles, intangible assets, knowledge assets, and intellectual capital are more or less synonyms. All are widely used — intangibles specifically in the accounting literature, knowledge assets by economists, and intellectual capital predominantly in the management literature." Therefore, these terms can be seen as synonyms representing the same thing.

A differentiation has to be made, however, between intellectual capital and knowledge management. Marr et al. (2004, p. 553) classify the concept of intellectual capital as the major contribution to one of two streams that discuss knowledge resources of organisations. In the first stream knowledge is seen as an organisational asset which is a major part of an organisation's value. With intellectual capital the components of organisational knowledge assets can be identified and classified. Therefore, knowledge assets and intellectual capital can actually be seen as synonym terms.

The second stream, however, is taking an epistemological approach and knowledge is interpreted as an entity instead of an asset. In his approach there is a distinction made between tacit and explicit knowledge (Marr et al., 2004, p. 552f). Tacit knowledge is implicit knowledge which cannot be codified, stored, taught or articulated. In other words, it exists only in the heads of employees or within relationships. Explicit knowledge, in contrast, can be codified and put into repositories like databases; it is trainable and can be disseminated (Dalkir, 2011, p. 10).

Knowledge management addresses both streams mentioned, the first one in which knowledge is seen as an asset and intellectual capital plays the essential role and the second one which encompasses tacit and explicit knowledge and it is seen as an entity (Dalkir, 2011, p. 14).

In this sense, intellectual capital can be seen as stocks of an organisation and it covers its whole operations, whereas knowledge management is a process to maintain and let the intellectual capital stocks grow (Starovic & Marr, 2008, p. 19) in which case differentiation of the two terms is necessary.

Another related term which has to be differentiated is "goodwill". This is especially important when it comes to the valuation of companies. Goodwill is the difference between income value, in other words the purchasing price in case of selling a company, and the net asset value. Goodwill includes also components which are not part of intellectual capital. For example, a higher price due to negotiation skills of the seller is part of derivative goodwill but is not included in intellectual capital. Furthermore, intangibles include separately activated intangible assets which are not part of goodwill (Schmalenbach, 2005, p. 227).

2.3 Intellectual capital reporting

"IC Reporting [sic] is the process of creating a story that shows how an enterprise creates value for its customers by developing and using its Intellectual Capital. This involves identifying, measuring, and reporting its Intellectual Capital, as well as constructing a coherent presentation of how the enterprise uses its knowledge resources." (European Commission, 2006, p. 11) The description shows the purpose of intellectual capital reporting and which steps should be involved in the process.

The difficulty lies in the identification and measurement of intellectual capital due to the fact that it is non-physical in nature (Kujansivu & Lönnquist, 2007, p. 272). A missing measurement, and consequently the inability to predict intellectual capital within an organisation, leads to the circumstance that it does not go further than a hypothesis since it fails the classic test of the scientific method (Pike et al., 2005, p. 491). In addition, without a systematic analysis of an organisation's intellectual capital there is a lack of understanding about the key driver of value creation (EFFAS, 2008, p. 1), what in further consequence leads to a less reliable assessment of the company value (Alwert et al., 2009, p. 361).

The mentioned issues result into three main approaches to cope with the problems: (1) a reconditioning and rethinking of accounting systems related to treatment of intangibles, (2) a disclosure of new information in the existing accounting framework and (3) supplemental reporting outside the existing accounting framework (Frederick, 2009, p. 20).

(1) Reconditioning and rethinking of accounting systems related to treatment of intangibles: The key message of this approach is, if it holds that the financial statement does not reflect the value drivers, the system has to be changed fundamentally. This means that intellectual capital has to be put on balance sheets to show all the relevant information to respective stakeholders (ibid. p. 20). Edvinsson and Bounfour (2004, p. 57) have the opinion that the retrospective view on costs and transactions of the traditional accounting system has on the one hand the consequence that there exists growing confusion in the understanding of value creation interactions, and on the other it leads to misallocation of resources by investment institutions. These are the reasons why a different system is needed. This system has to be longitudinal and a visualisation, cultivation and capitalization of value creating interactions have to be made possible.

The aim of capitalization is that expenditures on for example training are considered more as investments than as costs. However, the problem occurring with capitalization is, that within the conceptual framework of accounting an asset has to fulfill certain criteria, like recognizability, measurability, and controllability, and these attributes are difficult to find with most of intangibles (Frederick, 2009, p. 20f).

(2) Disclosure of new information in the existing accounting framework: The increasing importance of intellectual capital and its measurement as well as its reporting led to changes in accounting standards related to intangibles done by governments (Frederick, 2009, p. 26). Especially when it comes to a decline in value due to an exhaustive use of intangible resources, i.e. intellectual capital, reported earnings are not the appropriate measure to display the decline. The shift from short-term to long-term orientation related to performance achievement, has to be expressed in other terms than earnings, because it is a far less valid indicator of changes in the company's long-term competitive position (Johnson & Kaplan, 1987, p. 202). In this approach there is no need for a fundamental change of the accounting framework, but for an adaption of the latter to allow greater information on intangibles to be provided within the existing reporting model (Frederick, 2009, p. 24).

Two relevant contributions on the change of communication on non-financial data for Germany are the European Union Accounts Modernisation Directive (Directive 2003/51/EC of the European Parliament and of the Council of 18 June 2003, AMD), and the German Accounting Standard 20 (GAS 20) Group Management Report (near final standard).

Though the EU directive does not explicitly mention intangibles or intellectual capital, it is stated in Article 36 paragraph 1: "The review shall be a balanced and comprehensive analysis of the development and performance of the business and of the position of the undertakings included in the consolidation taken as a whole, consistent with the size and complexity of the business. To the extent necessary for an understanding of such development, performance or position, the analysis shall include both financial and, where appropriate, non-financial key performance indicators relevant to the particular business, including information relating to environmental and employee matters." The important change here is the indication of "employee matters" which could be relevant for development and performance of a business and the possibility to include respective key performance indicators² (KPI) in the report.

² Key Performance Indicators are "factors by reference to which the development, performance or position of the business of the company can be measured effectively". (Frederick, 2009, p. 30)

A very recent governmental contribution to the topic of reporting on non-financial indicators is the GAS 20 Group Management Report (near final standard) which was adopted by the Accounting Standards Committee of Germany (ASCG) on September 14, 2012. With the publication of the standard on September 28, 2012 at the homepage of ASCG and the request for publication at the Federal Gazette it thus obtained the standard legal force. The GAS 20 applies for all parent enterprises that are required by law to prepare a Group Management Report (GMR) and to companies who produce management reports voluntarily. The aim of a GMR under this standards is to report on the use of resources and the provision of information to allow the knowledgeable user to gain an appropriate picture of business performance, the position and expected development of the publishing organisation as well as of with the development of accompanied opportunities and risks (ASCG, 2012, p. 6). The link to intellectual capital is made where the standard stipulates that the analysis of business performance and the position of the organisation shall include not only financial but also non-financial key performance indicators as long as they are important for understanding the business performance and position. Some examples for relevant non-financial performance indicators are provided in marginal number 107 like customers' interests (e.g. customer satisfaction), employees' interests (e.g. employees' satisfaction, fluctuation rate, training programs), indicators for research and development, and social reputation of the company (e.g. indicators for social and cultural commitment or corporate social responsibility) (ibid p. 23). Therefore changes in customer relationships, human capital, and structural organisational capital should be disclosed if they could significantly affect the economic position of the publishing organisation.

(3) Supplemental reporting outside the existing accounting framework: In the third approach provision is made for a complete disconnect of respective information on intangibles from the traditional accounting and financial reporting. The main message of this approach is that a fundamental change of existing reporting frameworks is neither feasible nor necessary (Frederick, 2009, p. 20). Therefore, new specialized forms of reporting on intangibles are arising with the objective to make values of intangibles measurable, verifiable and in further consequence comparable (ibid. p. 25).

The already mentioned guidelines of the MERITUM project and the Wissensbilanz in Germany are examples of supplementary reporting by using a certain framework.

MERITUM stands for MEasuRing Intangibles To Understand and improve innovation Management and was a joint research project of six European Union member states (Denmark, Finland, France, Norway, Spain, and Sweden). The main aim was to provide a conceptual framework for managing and reporting intellectual capital (MERITUM, 2001, p. 5f).

The Wissensbilanz project, which was sponsored by the Federal Ministry of Labour and Economics, was conducted by financial and knowledge management experts and filled the gap between politics, the financial community, the industry and the business sector (Edvinsson and Kivikas, 2007, p. 377).

The main aim of the project was to support small and medium-sized enterprises (SMEs) in protecting and enhancing their competitiveness by providing an instrument, which is able to display and evaluate their competitive advantage - the intellectual capital (Arbeitskreis Wissensbilanz, 2004, p. 7, Edvinsson and Kivikas, 2007, p. 377). The instrument used is an intellectual capital statement and is defined as "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 elements." (Arbeitskreis Wissensbilanz, 2004, p. 11) By showing the goals and the linkage to business processes, intellectual capital and the intellectual capital statement should therefore be seen as a tool which takes the strategy, the realization of the strategy and the its impact into account.

All of the organisations participating in the testing to create the guidelines perceived the implementation of an intellectual capital statement as a positive contribution to the competitiveness and the development of the organisation (Arbeitskreis Wissensbilanz, 2004, p. 10). Prototyping and implementing organisations can be found in both, product oriented companies as well as service enterprises like banks or hospitals (Edvinsson & Kivikas, 2007, p. 377). The fact, that the instrument of an intellectual capital statement can also be used by hospitals is shown by some cases (OECD, 2012, p. 102). A

detailed examination of intellectual capital reports in hospitals will be done in the empirical part of the present thesis.

2.3.1 Requirements by financial analysts for IC disclosure

The opportunity to report intellectual capital as a component of an organisation's value leads to better decision making by banks and investors. By allowing investors to see how resources are invested and where the added value comes from, transparency increases. Consequently, this leads to a lower risk for investors. Due to a lower risk, organisations can expect to benefit from lower interest rates and better access to loans. Therefore, a very practical help can be seen in the disclosure of intellectual capital through an intellectual capital statement (Frederick, 2009, p. 52).

According to a study conducted by Alwert et al. an intellectual capital report should have the structure and content as shown in the following table 2 to meet the requirements of financial analysts.

Table 2: Revised structure and content of an intellectual capital report

Structure and content		
1	Summary	Key points are summarized
2	Data related to market and industry	This includes the business environment of an organisation with its main activities, its industry background and the competitive environment
3	Description and explanation of the business strategy	The main strategic objectives and the relation to intellectual capital should be displayed
4	Definition and explanation of most relevant IC factors	List of all IC factors and a short organisation specific definition should be included
4.1	Data about the current status quo of IC	Indicators for quantitative analysis and qualitative description of the current state of IC should be provided
4.2	Analysis of IC	The result of analysis should be a picture on development areas for IC
4.3	Measures for the utilization and development of poor performing IC factors	A list of measures for developing IC is included as well as accompanied budget figures and expected outcomes. Consistency is required according to the business environment and strategy, and the status quo of IC
5	Appendix	Includes complementary details and more elaborate definitions

Source: Alwert et al., 2009, p. 359f

Part 2 and 3 are essential when the intellectual capital report is separated from the annual report of an organisation. If this information is missing a reasonable conclusion would be impossible (Alwert et al., 2009, p. 359).

Indicators play the most important role in intellectual capital reports and have therefore the highest priority to experts from the capital market. Contextual (qualitative) statements are also of high importance but an additional interpretation plays only a minor role. Although indicators are highly industry specific and specialized they contribute to the credibility of a report. The aspect of a certain timeline for which an indicator can be provided is seen as very important. At least data from the past two years and a forecast of one year should be given. The top five indicators for analysts are "Education and

qualification of employees", "Fluctuation (recruits and exits)", "Turnover per customer segment", "Customer satisfaction based on surveys", and "number of customer complaints" (Alwert et al., 2009, p. 361f.).

Planned measures for development of intellectual capital should also be included in an intellectual capital report. This should be done in reasonable detail and followed by a budgeted figure related to estimated expenses for planned measures (ibid p.362).

An intellectual capital report should normally count around ten pages. Some experts would prefer even shorter statements (up to five pages) but the maximum length of the report should not exceed 20 pages (ibid. p. 361).

These requirements do not significantly differ between banks, financial analysts, and auditors so there are no adjustments needed when conducting an intellectual capital report (ibid. p. 360).

Within the context of a case study experiment conducted by Alwert et al. (2009) it can be stated that the disclosure of information on intellectual capital has effects on the valuation of a company done by financial analysts. A more homogenous result in rating of credit worthiness can be reached when adding intellectual capital reports to classical annual reports. Furthermore, additional information on intellectual capital increases the homogeneity of the assessment of the future development of organisations. Due to the fact that with supplements on IC the transparency of strengths, but also of weaknesses is increased, the addition of respective data does not necessarily mean a "better" rating of organisations. Nevertheless, with more transparency the risks and information asymmetry can be reduced. Consequently both parties, organisations on the one side and financial institutions on the other side, can benefit because there is more accuracy in the process of raising capital (Alwert et al., 2009, p. 366).

3 Intellectual capital and value creation of hospitals

The healthcare sector is characterized as a highly knowledge-intensive industry comprising of the oldest knowledge profession, medicine (Peng et al., 2007, p. 539; Drucker, 1999, p. 94). It includes a high number of actors and stakeholders which makes the performance measurement and management more difficult compared to other industries (Peng et al., 2007, p. 539). Furthermore, healthcare organisations cannot be seen as either people-centered or process-oriented companies, which would facilitate to show the value creating resources (Roos et al., 2001, p. 23f). In organisations within the healthcare sector like in hospitals characteristics of both types of companies are of high importance (Peng et al., 2007, p. 541).

Although the work in the healthcare sector is very much based on knowledge, and the outcome is dependent on intellectual capital, the published research on the topic is limited. Especially in the field of intellectual capital in hospitals in Europe (see e.g. Habersam & Piber, 2003 and Zigan et al., 2008) there is little research published (Guthrie et al., 2012, p. 74). The following chapters will elucidate the status quo of intellectual capital and value creation in hospitals as well as how knowledge is transferred in the respective field. Additionally, an insight of the efficiency measurement and the valuation of a hospital is provided.

3.1 Value-added chain of a hospital

The value creation through pursuing the multiple missions (patient care, research and teaching) rather than through a sole profit maximizing approach raises the attention on the management of intellectual capital in the setting of a hospital (Peng et al., 2007, p. 541). The delivery of high quality care is dependent on the appropriate application of specialized knowledge, skills and abilities of all employees of a hospital (Van Beveren, 2003, p. 91). Empirical data from Habersam and Piber (2003, p. 766) showed that intellectual capital "is highly relevant for hospitals."

However, the assessment of added value in a hospital is more difficult compared to other industries. As the primary performance goal of a hospital lies in the improvement, respectively in the change, of a patient's health status this should be considered as added value. The difficulty lies, however

in the measurement of this primary performance goal and a direct measurement is hardly possible. As opposed to this the primary input to achieve the primary performance goal is measurable. Primary input measures include diagnostic services, treatment, operations, etc. (Kersting, 2008, p. 300).

How value is created in a hospital is shown in the value-added chain. This chain displays the core process of a hospital as well as supportive processes to be successful in the core process. The core process of a hospital can be easily described in three main steps: admission, treatment (comprising diagnostics, therapy, and care) and discharge. The vision and goals of a hospital give the direction for strategy building and implementation and are therefore important parts of the value-added chain. Derived from the vision and goals are the business and the knowledge strategy. Supportive processes include quality management, finance and accounting, human resource management, information technology management, project management, material management, pharmacy, and facility management to name the most relevant ones. The successful execution of the core processes with the assistance of supportive processes leads to value creation and business success (Töpfer & Großkatthöfer, 2006, p. 121). "For the identification and separation of single value drivers, an analysis of the value-added chain and the industry specifics is necessary." (KPMG, 2010, p. 21)

The relationship of intellectual capital to the business processes of a hospital (including the core process and supporting processes) i.e. the value-added chain is shown in the following figure 1.

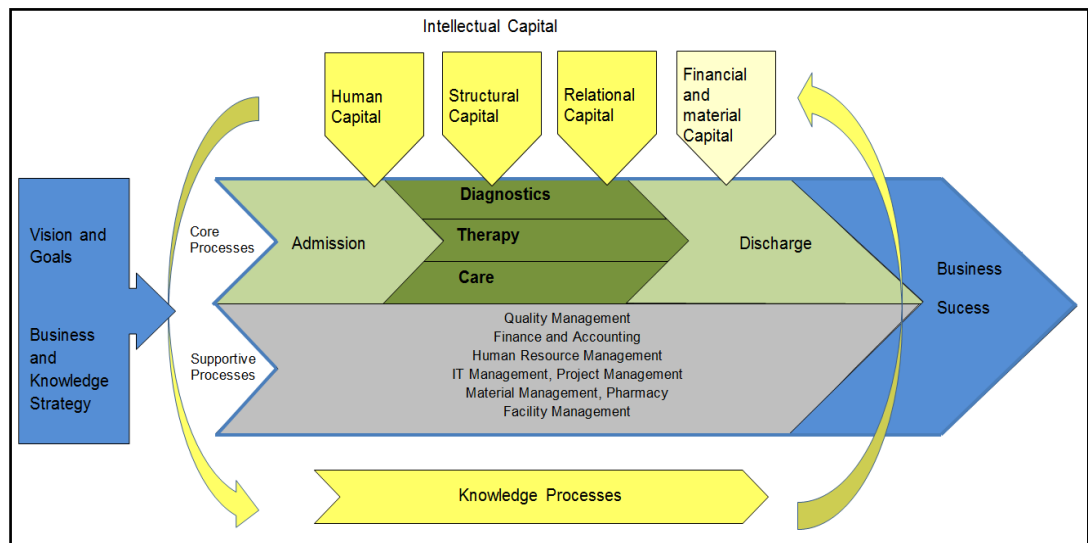


Figure 1: Value-added chain of a hospital and influencing factors, source: own representation based on Töpfer & Großekathöfer, 2006, p. 121; Heiligenfeld GmbH, 2009, online

Human capital components like social competencies and staff motivation can be seen as essential intangibles in order to provide high quality services. There is a close relationship between the performance of healthcare workers based on their motivation and intelligent behavior and the hospitals' performance (Zigan et al., 2008, p. 58f). Professional experience, further personal training and communicative abilities as further components of human capital has been identified as highly important parts of intellectual capital (Habersam and Piber, 2003, pp. 760ff).

Structural knowledge which is embedded in the processes of interaction between intangible and tangible resources as well as in installed management systems is also an important resource which is intangible in nature (Zigan et al., 2008, p. 58). Important is here, that also in hospitals "the competitive advantage of organizations does not come from knowledge itself, but from the ability to make knowledge productive." (Stam, 2007, p. 631)

Beside these two components of intellectual capital also the relational capital plays an important role, which is reflected in the high number of different stakeholders with different demands. Patient satisfaction as one of the most important intangible resource (Zigan et al., 2008, p. 58) and is part of relational capital.

There is empirical evidence, that the three components of intellectual capital (i.e. human, structural and relational³ capital) have a positive and meaningful effect on the performance of a hospital. 42 % of changes in organisational performance have been the result from changes in intellectual capital. Although this is less than in other research fields, it is a considerable result. Furthermore, it is shown that the three components are strongly interrelated (Rafiei et al., 2012, p. 3551f).

This shows that employees are necessary success factors related to good performance, but furthermore, also structural capital and relational capital are performance drivers. Only a comprehensive view on all components of intellectual capital and the interaction with tangibles allows accurate strategic decisions in order to improve a hospital's performance (Zigan et al., 2008, p. 59) and find the crucial elements for the definition and creation of value.

Consequently, the input of the components of intellectual capital and the derived knowledge processes are substantially affecting the business success as the outcome of the core and supportive processes. To fulfill the tasks of the business process financial and material capital is also needed. The defined vision and goals as well as the derived business and knowledge strategy with key success factors are the starting point for allowing business success and consequently also an increase in the value of a hospital.

Due to the importance of intellectual capital and knowledge processes in a hospital the following chapter provides a deeper insight into the topic.

3.1.1 Knowledge transfer in hospitals

Knowledge has to be transferred between owners of knowledge (Wilkesmann et al., 2007, p. 3) to become a source of value creation for key stakeholders.

"Knowledge transfer in organizations is the process through which one unit (e.g., group, department, or division) is affected by the experience of another." (Argote & Ingram, 2000, p. 151) The individual level is not mentioned in this definition, though individual persons are involved in

³ The study used the term "customer capital" instead of "relational capital" but it comprises the present and the potential value of organisation external relationships and the external dimensions of the organisations' income process (Rafei et al., 2012, p. 3549). Therefore it corresponds with the explanation of relational capital as mentioned before.

knowledge transfer and individuals' characteristics, such as experience, values, motivation, beliefs are important factors for knowledge transfer at organisational level (Albino et al., 2004, p. 585).

However, the analysis of processes in knowledge transfer has to exceed the individual level in favor of higher levels like groups or departments. The manifestation of knowledge transfer is recognizable in a change of performance of the recipient unit. Consequently a change in performance can be a measure of change in knowledge transfer (Argote & Ingram, 2000, p. 151). This shows that the transfer of knowledge is influenced by the tight relation between source of knowledge and its beneficiary (Albino et al., 2004, p. 585) and that it can be measured in change of performance.

In the context of a hospital, knowledge transfer means collaboration. Collaboration among health care professionals is necessary to produce the wished outcome, namely the health of the patient (Wilkesmann et al., 2007, p. 7). In order to examine the knowledge transfer in hospitals in Germany a representative study was conducted in 2006 by Wilkesmann et al. among doctors and nurses.

The results show that knowledge transfer is positively related to the amount of possibilities of interaction (meetings and breaks) among healthcare professionals. This means that with an increase of possibilities of interaction the amount of knowledge which is transferred increases. The rising use of computers amongst doctors has also helped to positively influence knowledge transfer. For doctors, knowledge provision and receipt are both positively affected by computer aided communication. At that time (2006) nurses did not have regular access to computers, which was the explanation by the authors for the lesser importance of computer mediated communication for nurses. Furthermore, the intrinsic motivation of healthcare professionals instigates knowledge transfer. The intradisciplinary team culture (i.e. team culture within the profession) has strong effects on knowledge transfer on both occupational groups, whereas the interdisciplinary team culture has no effect on the transfer of knowledge, which shows a preferable working of the groups within their own profession. A rising level of shared organisational values does only increase the obtaining of knowledge of doctors whilst there is no measurable effect for nurses. The size of the teams

has no influence on the knowledge transfer. There was no significant effect measured (Wilkesmann, 2007, p. 20f).

The results show that there are many similarities but also differences in the knowledge transfer process (sharing and providing knowledge) between doctors and nurses. Transferred to intellectual capital this would mean that in both groups knowledge transfer is influenced by structural capital because they need space for face-to-face interaction, which would be embedded in organisational routines. Additionally there is importance for access to computer-mediated possibilities of knowledge transfer, i.e. appropriate IT-infrastructure. A strong effect in both groups is also shown on team culture, indeed only within the own profession, which is as organisational culture also part of structural capital. Though there is a clear difference observable related to a rising level of shared organisational values which does not have any effect on knowledge transfer at nurses, but increases the obtaining knowledge of doctors, the influence of structural capital is visible.

The influence of human capital is explicitly shown by the precondition that the knowledge transfer has to be intrinsically motivated. Implicitly, competencies and skills of the professionals within respective groups play a decisive role.

The scope of the study is an internal view on knowledge transfer between employees (ibid. p.3) which is the explanation that there is no hint of an influence of relational capital on knowledge transfer.

3.2 Business success and efficiency of a hospital

In order to measure business success of a hospital its efficiency has to be considered. Generally, efficiency is distinguishable in two forms: productive efficiency and allocative efficiency (Blanc-Brude et al., 2006, p. 8). The productive efficiency in a hospital refers to the best financial outcome in ratio to available funds by reducing cost for example. Whereas allocative efficiency "refers to the value of the hospital compared to other possible uses of the resources." The health gain associated with the hospital would be an example for this kind of efficiency. By reducing for example maintenance or operating costs a higher grade of productive efficiency could be displayable but of greater strategic importance would be to increase the allocative efficiency (Dewulf & Wright, 2009, p. 140). Obviously, in the best case both types of

efficiency are increased. An increase exclusively in productive efficiency is not desirable because it does not reflect the real value of a hospital.

Another distinction can be made into technical and cost efficiency of a hospital. The technical efficiency is a measure of how much additional output a hospital could produce with a given amount of inputs (output orientation) or alternately how many fewer input a hospital could use and still produce the same level of output (input orientation). The cost efficiency, by contrast, is a measure which reflects a combination of cost-minimizing inputs at given unit prices for these inputs, (Tiemann et al., 2011, p. 164), i.e. there is no consideration of the clinical output. Cost efficiency can therefore be compared with productive efficiency where the best financial outcome regardless the clinical outcome is measured. This might lead to the misinterpretation of a hospital's efficiency because the quality of services is not part of the measurement.

Indeed, the monitoring of the quality of care, and consequently the outcome of treatments, is of crucial importance for the business success (Tiemann et al., 2011, p. 170). The outcome achieved, i.e. the patient results, is essential to measure the value of health care. According to Michael Porter (2010, p. 2477), value in health care is defined as "health outcomes achieved per dollar spent". The overall goal for health care delivery must be the achievement of high value for patients and this should be seen as the framework for performance improvement. Efficiency is encompassed in value as it is a ratio between outcomes and costs (Porter, 2010, p. 2477). This shows again that a purely view on cost or productive efficiency would be misleading and even dangerous.

3.3 Valuation of hospitals

The understanding of value creation in a hospital is the crucial point for starting a valuation process. The enterprise value of a hospital is determined by the benefit it can generate in the future. This benefit is based on an existing corporate concept at the time of valuation, as well as on a hospitals' key success factor, range of services, positioning on the market, internal organisation, employees and its management. The corporate concept is to be understood as whether the organisations' goal is primary financial or material related. Although a primary financial goal is supposed to be found in private

hospitals, and a material oriented goal in non-profit or public hospitals, there is a trend of convergence of corporate concepts. In this sense also non-profit and public hospitals tend to generate periodically surpluses to compensate decreasing funding rates and increase ability to invest from its own earning power. Therefore a main distinction can be made in the way the income is used (Albat & Patzak, 2010, online).

The valuation of hospitals can be based basically on two major purposes: a legal/contractual reason or a managerial decision. Legal reasons for valuation are among others the determination of exchange parities in mergers or the change of legal form in privatization. A valuation based on managerial decision can be rooted in relationship with a purchase or a sale of an organisation or an intended input of equity and debt financing (ibid.). In general, the methods for business valuation can be divided in the market approach, the cost/ asset approach and the income approach (Fries, 2003, p. 24).

The market approach, which is based on actual paid prices for hospitals as benchmarks, can be also be used. However, this approach lacks in comparability of valuation objects. Furthermore, synergy potentials, measures for rationalization and other future oriented measures are not valued at all. Therefore, the market approach is only suitable when complemented by the income approach (Albat & Patzak, 2010, online; Fries, 2003, p. 37).

The cost or asset approach in form of net asset or liquidation value is inappropriate for the valuation of hospitals. It is based on a reference date and intangible assets as well as future development are not taken into account at all (Hitchner, 2011, p. 1169; Fries, 2003, p. 37). In other words, many important factors in valuing a hospital like potential growth or the value of intellectual capital are left out which leads to an inappropriateness of the cost or asset approach.

The income approach includes two very similar methods: the capitalized earnings method (capitalization) and the discounted cash flow (DCF) method. Both methods are based on the same theoretical basis for investment (calculation of value of capital) (Albat & Patzak, 2010, online).

The capitalization uses estimates that are available from the historical profit and loss accounting system and is based on the assumption that future

earnings are homogenous with respect to risk. The method makes use of one discount rate to all future earnings (capitalization rate). Finding the right rate has high difficulties and this implies one of the disadvantages of the method (Fries, 2003, p. 26).

The most widely used method is the DCF method where an analysis of facts, circumstances, and risks related to future volumes, revenues, and expenses leads to a calculation of the expected cash flow of a hospital. All future cash flow surpluses are determined and discounted to the valuation date. The DCF method, when compared to the capitalization, is method less dependent on accounting strategies and therefore less susceptible (Hitchner, 2011, pp. 1126 ff; Fries, 2003, p. 25).

Related to the valuation of intangibles the "Institut der Wirtschaftsprüfer in Deutschland e.V." (Institute of Public Auditors in Germany, Incorporated Association) (IDW) has issued a standard called "IDW S 5: Grundsätze zur Bewertung immaterieller Werte" (Principles for the valuation of intangible assets) (IDW S 5). The IDW 5 reflects the fact that auditors are recognizing the importance of intangibles in the valuation of companies, especially in knowledge-intensive areas. One focus of IDW 5 lies in the valuation of relationships to customers, i.e. the relational capital of an organisation (KPMG, 2010, p. 19; Zwirner, 2010, online). For the special field of the valuation of intangibles the income approach with the methods of DCF is the preferred scheme (KPMG, 2010, p. 23).

After comparison of the three mentioned approaches the most appropriate valuation approach for hospitals seems to be the income approach, particularly the DCF method. Especially when taking the valuation of intangibles into consideration this methods convinces with its advantages compared to the other approaches.

The following figure 2 provides a summary of the three mentioned approaches for valuating a hospital with special respect to the high importance of intangibles.

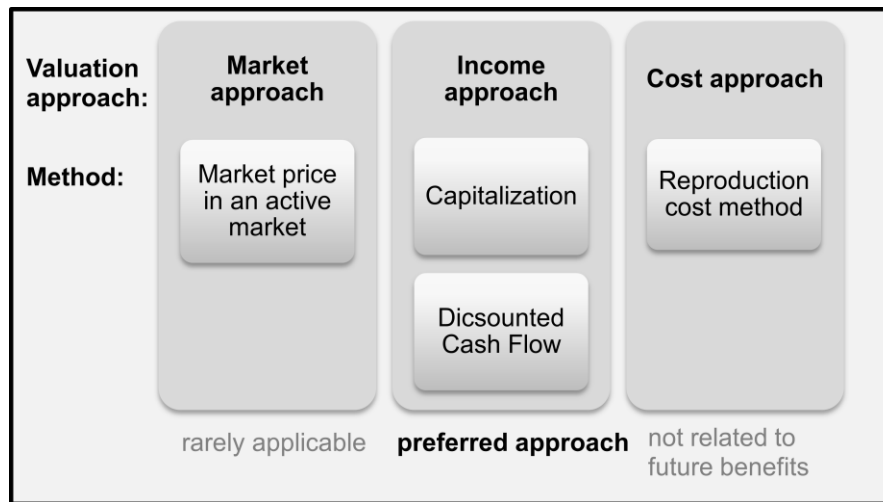


Figure 2: Summary of valuation approaches and methods, source: own illustration

4 Description and trends of the German hospital market

The German hospital market has undergone substantial changes within the last decades and must remain adaptive for future developments. During the past few years there has been a decrease of facilities (number of hospitals) and beds within the general hospital sector. The most recent figures from 2011 show that currently 2.045 hospitals are on the market and there are 502.029 beds available. Due to a significant drop of length of stay also the charging and occupancy days decreased. At the same time there is a considerable increase of number of cases perceptible to a current amount of more than 18 Million cases (Federal Bureau of Statistics, 2012b, p.11).

Figure 3 shows a summary of important key indicators of the German hospital market.

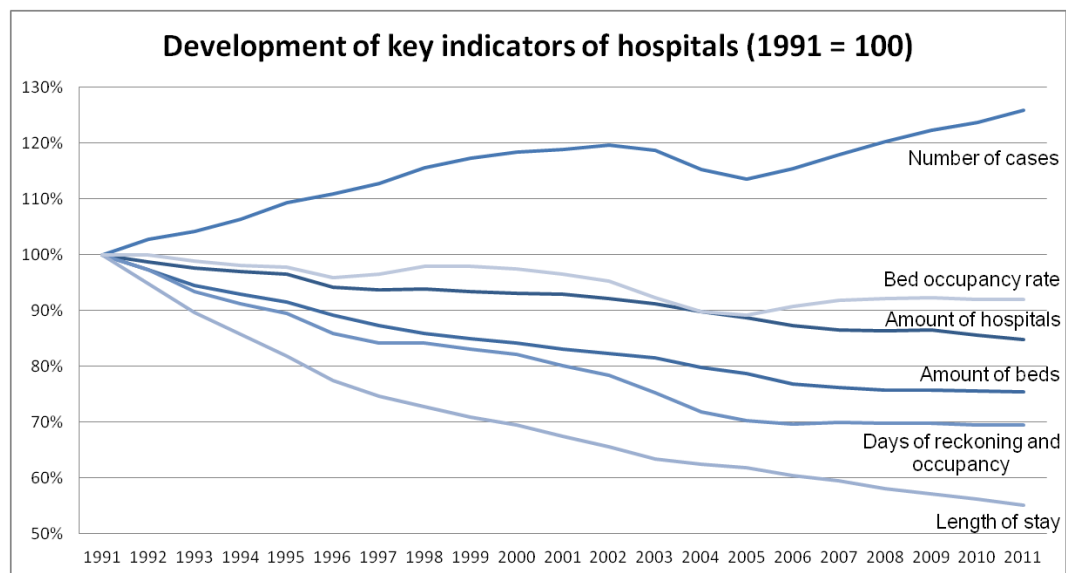


Figure: 3 Development of key indicators of hospitals (indexed), source: Federal Bureau of Statistics, 2012b, p.11, own calculation

More than 1 million⁴ health care workers have been employed in hospitals in 2010, which is 23 % of the whole amount of employees working for the health care sector. Furthermore, this denotes that almost 3 % of the whole German working population⁵ has been part of the hospital market in carrying out a job in a hospital (Federal Bureau of Statistics, 2012a, p. 136; Federal Bureau of

⁴ Exact number: 1.121.000 (Federal Bureau of Statistics, 2012a, p. 136)

⁵ Exact number: 40.603.000 as preliminary result (Federal Bureau of Statistics, 2013a, online)

Statistics, 2013a, online). On the one hand, this shows the economic importance of health care workers within the German economy. On the other hand, due to the fact that the vast majority of people working in hospitals can be classified as knowledge workers (Drucker, 1999, p. 88), it emphasizes the importance of dealing with the topic of intellectual capital and its management in the context of hospitals.

The following chapters describe the most decisive historical and current influences for the German hospital market.

4.1 Financing of hospitals

The legal basis for planning, financing and auditing of the hospitals is built by the German Social Act No. 5 (Sozialgesetzbuch - SGB 5) and the Hospital Financing Act (Krankenhausfinanzierungsgesetz - KHG).

An influential modification for the financing of hospitals dates back already to 1972 when the Hospital Financing Act was passed, which introduced the "dual financing" principle in the acute hospital sector. This dual financing principle states a different financial scheme between investment costs, which are financed out of taxes from state and federal level, and running costs paid by mainly the sickness funds or by private patients, who may get reimbursement by their private health insurance. The prerequisite to receive tax money for investment is to be listed in the hospital plans set by the Federal States (Länder) and does not depend on the ownership. The investment has to be according to these plans and financial resources for this purpose have to be available in order to get the money (Busse & Riesberg, 2004, p. 72).

This case, where the accreditation of the hospital by the hospital plan is the main prerequisite to obtain capital for investment, is described as "free" public capital (Dewulf & Wright, 2009, p. 127).

Nevertheless, even if hospitals are listed in the hospital plans there is no guarantee to get all the requested investments financed. The power of decision lies with the Federal States and is based on political priorities as well as on the budgetary situation of the responsible ministry within the respective Federal State (Busse & Riesberg, p. 105). Even though the economic protection of hospitals is still stated in § 4 Hospital Financing Act, by declaring

that investment costs of hospitals shall be incurred by public funding, this cannot be seen as guaranteed.

Until January 1 1993 the "full cost cover principle" existed, which meant that all hospital spending had to be reimbursed (ibid. p. 166), but the commencement of the Health Care Structure Act (Gesundheitsstrukturgesetz - GSG) in 1993 abolished this principle and led to the possibility to make both deficits and profits (Haubrock, 2009, p. 604). It can be seen as the first major cost-containment law in this sector (Busse & Riesberg, 2004, p. 168).

An even more consequential structural and legal change occurred in 2004 with the implementation of system of diagnosis related groups (DRG). Since then, recurrent expenditures of acute hospitals that provide inpatient care are financed through DRG payments from statutory health insurance and private insurance funds (Busse & Riesberg, 2004, p. 165; Tiemann et al., 2011, p. 163). Additionally to the pricing and payment function, this diagnosed related system should increase the quality of services through an external quality assurance program (Tiemann et al., 2011, p. 163), it should make the services of a hospital measurable (INEK, 2009, p. 1), and furthermore, it should increase transparency of services, which are effectively provided and should incentivize an efficient use of financial resources (Geissler et al., 2011, p. 10). The increase of efficiency shall be reached amongst others under the heading of "money follows the service" (Schmidt-Rettig, 2008, p. 401) which is in sharp contrast to the full cost cover principle.

With a DRG system a benchmark function among hospitals can be provided by facilitating measurability and comparability. Hospital activity or hospital products are being measured through using clinically meaningful and economically homogenous groups (DRGs). As a consequence also hospital costs, quality and efficiency are comparable within and among hospitals (Quentin et al., 2001, p. 25). This leads to the effect of increased competition among hospitals (Berger & Stock, 2008, p. 32).

Due to changes in the legal and structural framework, providers in the hospital market are faced with an increasing competition as well as an increasing need for efficiency. As a consequence, the market is in an ongoing transition process.

4.2 Hospital market in transition

The German hospital market had and still has to experience and cope with considerable changes. A structural modification due to changing demands on behalf of different stakeholders, with patients leading the way, demographic change on patients' as well as on employees' side and technical development are the key drivers. Additionally, an increase of efficiency is demanded.

The still high involvement of government bodies in investment planning (Maarse & Normand, 2009, p. 117) and the historically grown dependence on governmental funding for investments as well as developments determining the pricing and competition of hospitals are leading to two main tendencies:

- Firstly, there is a movement towards privatization (Augurzky et al., 2012b, p. 11) and market consolidation (Augurzky et al., 2012a, online; Tiemann et al., 2011, p. 163).
- Secondly, there is a trend towards private alternatives for investment funding (Dewulf & Wright, 2009, p. 123; Ziehe, 2009, p. 1).

Crucial for both trends is to have a competitive advantage and the appropriate positioning of a hospital within the market. Both of the trends are described in the following sections.

4.2.1 Privatization and market consolidation

In the hospital sector in Germany, there is a co-existence of public (usually meaning ownership by local governments) and non-profit and private for-profit health care providers (Busse & Riesberg, 2004, p. 55). Whereby hospitals which are governed by public law have the highest market share (as measured by percentage of beds) with 48,4 %, followed by non-profit hospitals (34,3 %) and private hospitals (17,3 %) (Federal Bureau of Statistics, 2012, p. 14). The development from 2002 till 2011 is shown in the figure 4 below.

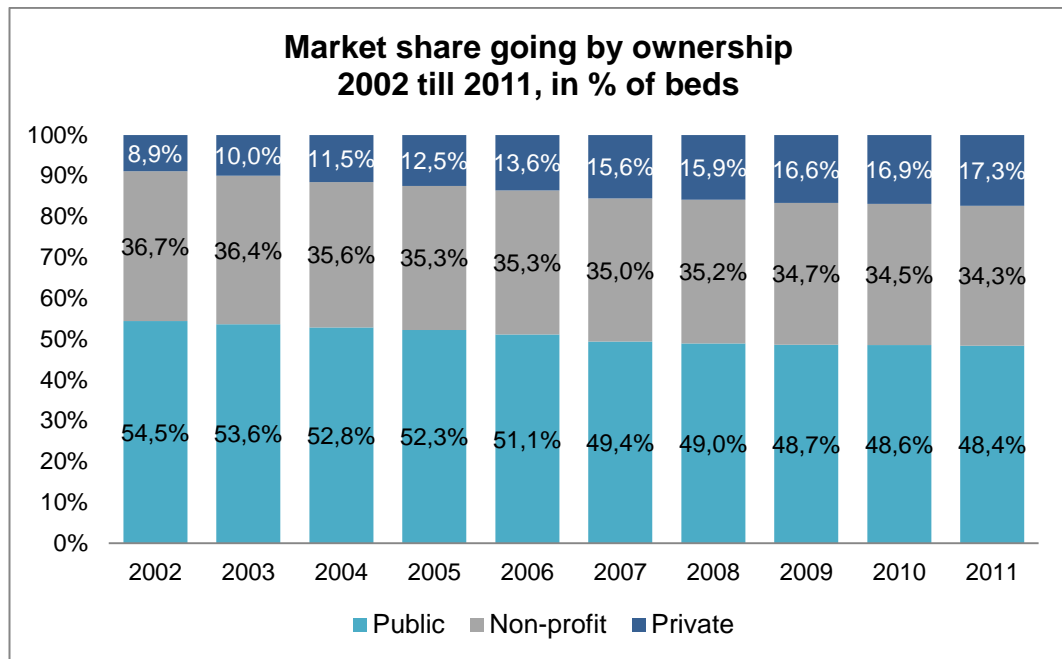


Figure 4: Market share going by ownership 2002- 2011, source: Federal Bureau of Statistics, 2012b, p. 14, own calculation

The trend shows an increasing market share of private hospitals. Compared to 2002 the share of privately owned hospitals grew by 8,4 % and has therefore almost doubled. Non-profit hospitals lost only 2,4 % over the last nine years, which shows a quite stable situation. The share of public hospitals decreased by more than 6 % but still holds the highest share.

The dynamic of privatization within the hospital market is often discussed and controversial in nature. The intent to realize a profit on the one side and the granting of high quality of treatment which is in line with demand and with blanket coverage on the other side raises the concerns of conflicting goals (Augurzky et al., 2012b, p. 11).

Structural changes in the direction of privatization, also implying the extension of profit-making medicine, are considered as a required element of market competition by many policy-makers. This does not mean that the shift from the public to the private sector is explicitly the result of decisions made at national policy level. The opposite is the case because decisions for privatization are mainly made on local level or through a "bottom-up" approach. The reasons for public owners to sell their hospital to private ones, or less tight contracted private companies to manage the hospital, have often

been a lack of productivity, incapacity to cover deficits or the shortage of federal funding for capital investment (Maarse & Normand, 2009, pp. 105ff).

Beside privatization, a considerable trend of market consolidation was perceptible over the recent decades, accompanied by a decrease in the number of general hospitals providing a wide range of acute and elective treatments (Maarse & Normand, 2009, p. 110). Mergers, acquisitions and cooperative agreements are considered as ways to improve competitiveness (Tiemann et al., 2011, p. 163). The trend of a declining amount of hospitals is recognizable in figure 3 above.

Due to economic reasons it is estimated that further hospitals will have to close in the nearer future. Currently, every seventh hospital is in extended danger of becoming insolvent (Krolop, 2012, online). There is a difference in performance related to ownership of hospitals. Public hospitals show a worse financial performance than non-profit and private hospitals. Another relation can be observed related to the size of hospitals, where smaller hospitals come off worse compared to medium or large sized hospitals. Furthermore, hospitals with a high sectoral specialization perform significantly better than others with a lower rate of specialization (Augurzky et al., 2012a, online). Bad performance and inefficiency of hospitals will lead partially to a market adjustment, which will be necessary to stabilize the hospital market in future the (Krolop, 2012, online).

There is a strong apparent transition in the hospital market. In the long run it can be assumed that there will be only a few (4 - 5) big nationwide hospital groups operating in Germany which will have a market share of about 60 %. (Krolop, 2012, online; Augurzky et al., 2012, online).

4.2.2 Need for alternatives for investment funding

The dual-financing model determines that investment and building costs must be borne by Federal States, according to the Hospital Financing Act (KHG), whereas running costs have to be provided by (mainly) sickness funds (Busse & Riesberg, 2004, p. 72). The problem is that the investment volume of public KHG funding is constantly decreasing (see figure 5 below). This considerable reduction of KHG funding by almost 50 % - real decrease since 1991 - is reflected in the ascertained investment rate of hospitals (DKG, 2012, p. 62f). Furthermore, the cost structure of hospitals shows an increasing trend

(Federal Bureau of Statistics, 2012a, p. 142) and it is expected that costs will rise more than the proceeds in the long run (Augurzy et al, 2012a, online).

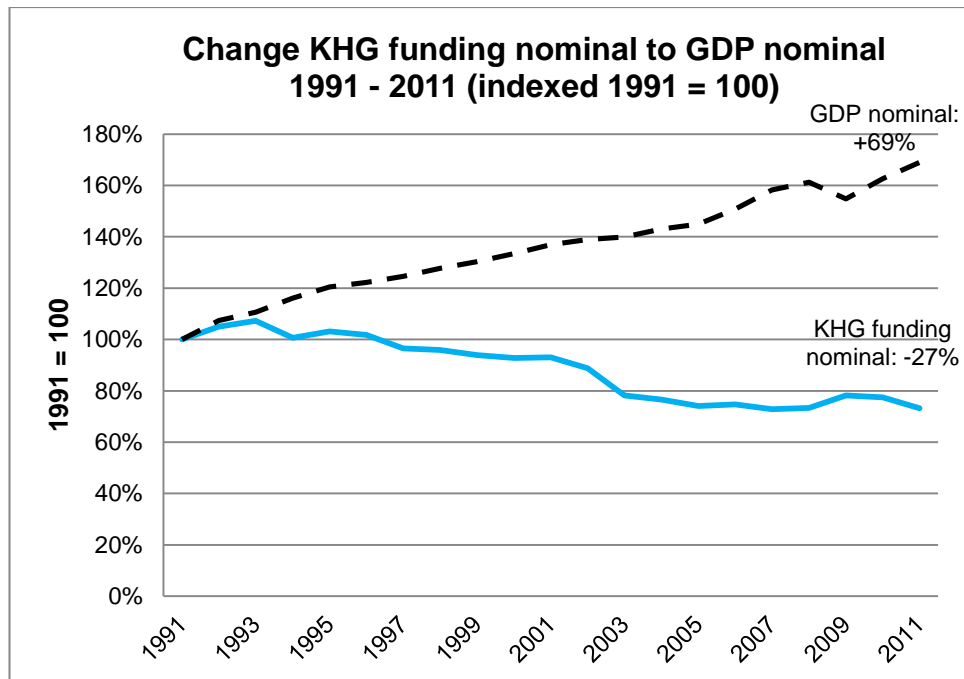


Figure 5: Change of KHG funding to GDP 1991 - 2011, source: Mörsch & Derix, 2010, p. 733; Federal Bureau of Statistics, 2013b, p. 5; DKG, 2012, p. 62; own calculation

The gap between the gross domestic product (GDP) (nominal) and KHG funding (nominal) is clearly evident. As identified in the figure 5 above, there has been a noticeable increase of KHG funding in 2009. Nevertheless, the decrease in the long run seems not to have ended, especially as in 2010 and 2011 there is again a reduction in funding visible.

The impacts of decreasing public funding and the consequential investment backlog are debated amongst the actors of the health care system. The calculated amount, depending on the use of different key figures, varies by several billions (Ziehe, 2009, p. 37). If a necessary investment demand per year of about 10 % of an annual turnover is taken as a basis, the cumulative investment gap since 1991 is aggregated to 30 billion Euros. When financial resources from equity capital are deducted the actual investment backlog seems to be 14 billion Euros. When it comes to investment capacity of hospitals the analysis turns out negatively. The Earnings Before Interest, Taxes, Depreciation and Amortization (EBITDA) inclusive KHG funding compared to turnover (EBITDA margin) was on average at about 8 % in 2009. For sufficient investment this rate should be above 10 % (Augurzy et

al., 2011, p. 13). Even if this quite conservative way of calculation is used, only about one third of all hospitals have a full investment capacity. There is a distinction visible according to the ownership of the hospitals. More than 50 % of private hospitals have a full investment capacity, whereas only 36 % of public and with 27 % still less of non-profit hospitals reach the rate of 10 % EBITDA margin (incl. KHG funding) (Augurzky et al., 2012b, p. 25).

This leads to the fact that during the transition period within the last decades significant weak points in efficiency and financing of hospitals have been revealed. As a consequence, hospitals examine and utilize alternatives to the current financing system to cover investment requirements (Ziehe, 2009, p. 1). This means, that the consideration and importance of autonomous capital market financing is increasing. Especially at bank loans the rating of a hospital provided by a financial analyst becomes of high importance. In further consequence this means that the quality and reliability of analysis data (retrospective and prospective) for the hospital rating play the essential role to display the current value of a hospital as well as the risk of financial insolvency in the future (Wedel, 2008, pp. 266ff).

In order to meet the challenge arising from the above mentioned drivers for change and the resulting consequences, innovation capacity (Piening, 2010, p. 1) as well as the management of intellectual capital become essential because organisational knowledge is the basis for sustainable competitive advantage (Bontis, 2001, 271). Indeed, hospitals have a distinctive feature compared to other knowledge-based service industries. The great majority of health care workers provide not only related knowledge work, but also manual work (Drucker, 1999, p. 88). In this setting the ability to combine knowledge assets, i.e. intellectual capital, with other assets is the basis to create value and competitive advantage (Teece, 2000, p. 29).

5 Empirical analysis of intellectual capital disclosure in hospitals

In order to answer the research questions of the present thesis, after the in-depth literature research an empirical analysis is conducted. The following chapters provide an insight in the chosen approach.

5.1 Sample of intellectual capital disclosure

In order to get the sample of intellectual capital disclosure of hospitals a three-stage search process was conducted.

In the first step a direct online search based on the information and hints gained through literature research was done. The Arbeitskreis Wissensbilanz publishes, online, organisations which already applied and are currently applying their framework for intellectual capital reporting (user phase I to user phase III) (Arbeitskreis Wissensbilanz, 2013, online). Derived from this publication, the first usable disclosures of Heiligenfeld Kliniken GmbH could be found. In a publication of the OECD (2012, p. 102) on knowledge networks and markets in the life sciences there is a direct mentioning of the provision of supplementary non-financial information of the private hospital chain HELIOS Kliniken GmbH. The online archive of HELIOS Kliniken provided further intellectual capital reports (HELIOS Kliniken, undated, online).

The second stage of the searching process comprised personal contacting via e-mail of respective press and public relations departments of hospitals to get information on external available disclosures. In this stage the important information was gained that HELIOS has gone a step further and includes its intellectual capital reports since 2008 in its annual reports. A supplemental report is not provided anymore (e-mail from responsible person for press and public relations to the author, 19.2.2013).

Finally, to increase the number of intellectual capital disclosures, a keyword search was done by using an online search engine to find matching documents. To get the highest possible number of search results the keywords were chosen based on terms used in German and English literature about external intellectual capital disclosure (see for example Edvinsson &

Kivikas, 2007; Arbeitskreis Wissensbilanz, 2004; Guthrie, 2001). The following keywords were used:

"Intellectual capital", "report", "statement", "hospital", "clinic", "Wissensbilanz", "Wissensbericht", "Wissenskapital", "Krankenhaus", "Klinik".

These words were used in singular and plural form, in German and English and in changing combinations.

Search results that were counted only included hits which displayed an actual, complete and downloadable report. Not included were (academic) publications about intellectual capital reporting, press releases or partial published reports. This is reasoned in the insufficiency of such publications for the further analysis due to incompleteness and incomparability of data.

After the three stages of the search process twelve downloadable reports of hospitals which contained information on intellectual capital from Germany and Switzerland were available. All of them were published in PDF format and free of charge. The publishing period was between 2003 and 2011 (at the reference date of 1 March 2013). The published information was either in the form of supplemental reports or integrated in the annual report of the hospital. In Germany only reports from private hospitals could be found, the reports from Switzerland were from a public hospital.

For the purpose of the present thesis the focus is in analyzing different intellectual capital disclosures according to the display of added-value gained through intellectual capital and according to the usability for the gain of external capital of hospitals. Due to the fact that HELIOS Kliniken published their intellectual capital reports on an annual basis from 2003 till 2006 only the most recent report of 2006 is included into the analysis. Reports from same hospitals were only included when a remarkable change in structure was visible, or the one report was based on the previous one (Folgebilanz). The annual reports of HELIOS were counted because the hospital explicitly stated that the intellectual capital report is included since 2008 into the annual report (email from responsible person for press and public relations to the author, 19.2.2013).

In respect of including and excluding factors, a sample of five reports is included in the present study.

5.2 Methodology

In IC reporting studies, the method of content analysis has a very high popularity (Guthrie et al., 2012, p. 75; Husin et al., 2012, p. 197). Its purpose is to deduct patterns from the published information by using a systematic, objective and reliable form of analysis (Krippendorff, 1980, p. 21).

The content analysis can be employed in different ways and a distinction can be made between two broad approaches: mechanistic and interpretative. The mechanistic approaches are frequency and volume oriented and are conducted in counting words or sentences, for example (Beck et al., 2010, p. 208). The main semiotic assumption of quantitative content analysis applies in that the discloser expresses the relative importance of the information by the volume of disclosure (Unerman, 2000, p. 675). Whereas the interpretative approaches have their focus on the underlying themes in the investigated texts, and are therefore meaning oriented. The interpretation of the texts' meaning is emphasized rather than the counting of information. This is to make it understandable how the information is meant. The quality and richness of the disclosed information are important factors to consider in this kind of content analysis because it gains to increase the understanding of what is communicated in which way (Beck et al., 2010, p. 208). Within the present thesis a combination of a mechanistic, quantitative approach and an interpretative approach is used. The quantitative method functions as a foundation to show the relative importance of disclosed information. Based on the quantitative analysis, the quality and richness of information is analyzed to gain a high resolution of meaning. (A detailed description of quality measurement is provided in chapter 5.2.3.)

5.2.1 Categorization and indicators

To use the method of content analysis, a description of which information is counted as relevant is essential. A three-level categorization process was used to analyze the material of the study.

In the first stage of the categorization process, two main categories were built according to the research questions. These main categories are called "Intellectual Capital Disclosure" and "Valuation". Secondly, derived from the literature, the main category of intellectual capital disclosure included the sub-

categories of "human capital", "structural capital" and "relational capital" (Beattie & Thomson, 2007, p. 134f). In the category of valuation requirements from financial analysts (Alwert et al., 2009, p. 359f) were supplemented.

In the third and final stage of categorization, the indicators of the sub-categories for intellectual capital were defined. The indicators comply partly with previous constructed intellectual capital indexes (see for example Husin et al., 2012, p. 199f.; Alwert et al., 2009, p. 362) but also take into consideration the special field of interest (hospitals) (Zigan et al., 2008, p. 58). These indicators can be qualitative as well as quantitative in nature. Due to the high importance of different weighting of the indicators, the chapter 5.2.3 addresses this topic in more detail. In case relevant information were found, which did not fit in the pre-defined indicators, new or modified indicators were built to avoid a loss of information.

In this sense, the three-level categorization process was conducted to examine the disclosed information including main categories, sub-categories, and indicators. The disclosure index with categories, sub-categories and indicators is provided in the annex I.

5.2.2 Unit of analysis

After the definition of which information is seen as relevant, the usage of content analysis involves the decision on the basis for coding (unit of analysis) and consequently on what should form the basis for measuring the amount of disclosure (unit of measurement or counting) (Beattie & Thomson, 2007, p. 142; Husin et al., 2012, p. 204). A unit of analysis could be narratives like words, themes, sentences, paragraphs or pages (Husin et al., 2012, p. 204) or non-narrative disclosures like charts, tables or photographs (Guthrie & Abeysekera, 2006, p. 17). Milne and Adler (1999, p. 243) state that: "As a basis for coding, sentences are far more reliable than any other unit of analysis. [...] Using sentences for both coding and measurement seems likely, therefore, to provide complete, reliable and meaningful data for further analysis." In this sense the analysis would be focused on sentences. Each sentence of the information disclosure would be examined for whether or not relevant information is included and to which sub-category or indicator the information is related to.

Although this approach seems to be relatively straightforward, there arises the issue of sentences comprising of information of more than one sub-category (Beattie & Thomson, 2007, p. 143).

To handle that issue the analyst has basically two options. Firstly, when retaining a sentence as unit of analysis, additional coding rules would be required to identify the dominant theme and enable the analyst to assign the information in the right sub-category. Secondly, an alternative to sentences as unit of analysis has to be found and parts of sentences, i.e. text units are used for the analysis. Indeed, choosing text units instead of sentences has implications on reliability as well as on complexity (Beattie & Thomson, 2007, p. 143ff). The reliability issue occurs because this procedure has effects on the number of units of recording and counting. The number of recording and counting units is unequal to the number of sentences and requires therefore specific coding decision rules in order to be able to count the total number of coding decisions. This increases complexity and affects in turn reliability. Consequently a multi-stage process is needed when using text units. After all the sentences, headlines, illustrations, and tables are coded as containing relevant information or not, all the sentences etc. agreed to contain relevant information would need to be coded in relation to how many pieces of information they were thought to contain. The agreed pieces of information are then coded with the respective indicator. Therefore, the number of coding decisions is equal to the agreed number of information pieces and the reliability can be increased (Beattie & Thomson, 2007, p. 143).

In the present thesis, the unit of analysis was chosen to be text units. This has the following advantages: the elimination of the problem that the coder would have to make a decision to which dominant indicator the information included in a sentence belongs to; less dominant information is still included; and it is possible to investigate the extent of relevant information in different sub-categories (Beattie & Thomson, 2007, p. 145).

Accompanied with the last point is the circumstance that the importance of the information is related to the extent of disclosure which can be better investigated by using text units. Published material, like annual reports and other disclosed information are commonly used signals for the display of what is important for an organisation by featuring and reporting important issues and the omission of less important items. It is a "conscious decision that

communicates a significant message to stakeholders” (Guthrie & Abeysekera, 2006, p. 4f). This leads to the assumption that the key components related with value creation of an organisation, which are therefore of high importance, are expressed in the disclosed information.

5.2.3 Extent and quality measurement of disclosure

A fundamental premise of content analysis can be seen in the assumption that the extent of information disclosed reflects the importance of different categories of information reported by an entity (Krippendorff, 1980, p. 21). Therefore not only presence or absence of information should be taken into account but also the extent and the quality of the disclosure.

As a first step the entire content of the supplementary intellectual capital disclosures, respectively the annual reports which included the IC statement, was manually analyzed to identify information on IC. Each sentence, headline, illustration, and table was classed as containing respective information or not (quantitative approach).

According to Yi & Davey (2010, p. 336), visual forms of communications like graphs, pictures or diagrams should be explicitly excluded from the analysis, due to the difficulty of interpretation. However, the opposite is argued by Beattie & Thomson (2007, p. 143), who state that the inclusion of visual forms of communication other than sentences and headlines is justified in the immediate and effective means of disclosure of information. Confirming this comes the opinion by Husin et al. (2012, p. 216) who examined also visual images as a form of intellectual capital disclosure and concluded, that “excluding visual images from the analysis may cause loss of information”. Furthermore, an ignoring of visual forms like graphics could result in an incomplete representation of the quantum of disclosure which in turn leads to a misinterpretation of the importance of information being disclosed (Unerman, 2000, p. 678). Graphs and diagrams are therefore part of the present analysis and photos were only examined in case there was a written explanation included.

Additionally, the volume of disclosure was captured by counting the number of times each indicator occurred. The number of occurrence was recorded to avoid a simple presence/absence approach. A repetition of the same information in different sections of a report might introduce redundancy.

However, repetition is also a communication strategy and a signal of importance about the information given by the management which is responsible for the disclosed information (Beattie & Thomson, 2007, p. 142).

After the quantitative analysis of the reports the disclosure quality of the sub-categories "human capital", "structural capital", and "relational capital" were examined in a second step of the investigation. The quality will be represented in the richness of displayed information (Husin et al., 2012, p. 211). According to Campbell and Abdul Rahman (2010, p. 62) the quality of intellectual capital reporting can be captured with two quality measures: "the nature of the information (narrative or quantitative/financial) and the level of factuality or judgement [sic] conveyed by the information." In this sense a factual information that is based on facts, can be verified and proven. If this cannot be fulfilled, the information is expressed as a perception or impression (ibid, p. 62).

A three-point scale ranging from 1, when information is discussed in general, over 2, when a specifically description of an item is ensued to 3, when the item is described in monetary or quantitative terms is used by Cormier and Magnan (2000, p. 435f) to express the value of information disclosure. The link to the level of faculty is not explicitly mentioned in their study.

More recently, Yi and Davey (2010, p. 334f) are also following the approach of distinguishing in narrative and quantitative/monetary disclosure but provide a six-point scale (0-5, 0 for non-disclosure to 5 for quantitative/monetary with narrative disclosure). The quality criteria also include the facts whether or not the indicator shows a clear influence on the company and if the published item is shown with reference (Yi & Davey, 2010, p. 334f.).

Generally the three mentioned studies have in common that the valuation of quality of published information is conducted by use of a rating based on the distinction in narrative and non-narrative, i.e. quantitative disclosure. A step further is provided by Campbell and Abdul Rahman (2010) and Yi and Davey (2010) who have incorporated the consideration of factual information. Whether a company published its information in a narrative, numerical and factual way can therefore be seen as an appropriate choice of quality measures. Based on this, a three-point scale combining the form of disclosure with level of factuality of disclosure is used for quality measurement (see Table 3 below).

Table 3: Forms of IC disclosure and quality

Form of disclosure	Attribute	Description	Quality	Weight
Narrative	Vague	Indicator is discussed only in narrative way. Indicator is described in using other indicators. There is no reference or comments to facts.	Low	1
Narrative	Descriptive	Indicator is discussed without using another indicator using detail narratives (but no supporting visual images or numbers). Reference or comments to facts which can be proven.	Medium	2
Narrative with numbers or visual images	Strongly descriptive	Indicator is expressed in using narratives and supported with either numbers (monetary or nonmonetary) or visual images. Reference or comments to facts which can be proven. Direct link to added value is made.	High	3

Source: own compilation, based on Yi & Davey, 2010, p. 334f; Husin et al., 2012, p. 214

It has to be mentioned that the sub-category of "valuation" was treated differently due to the fact that the relevant information was based on whether the examined reports fulfill the mentioned requirements by financial analysts or not. Furthermore the potential problem of double-counting due to possible overlaps in indicators was avoided. Therefore, an analysis of quality was not conducted for this sub-category.

6 Research results

External available reports of hospitals in which information on intellectual capital was disclosed were analyzed by using the methodology of content analysis and a disclosure index to see how intellectual capital can be measured, respectively how the information on it can be provided. Furthermore, a performance review of reports according to requirements set by financial analysts for valuation was conducted.

This research demonstrates that currently there are different approaches used by hospitals to provide information on intellectual capital. Information is disclosed partly without any established framework and without reference to trichotomy of human capital, structural capital and relational capital. Also reports without using a framework but with reference to the three components can be found. Some reports are prepared by making use of the framework of the German consortium Wissensbilanz and approaching a report in the form of a "Wissensbilanz- Made in Germany", which is also in regard to the three components of intellectual capital. The research results show that three reports were explicitly using the trichotomy and taxonomy of "human capital", "structural capital" and "relational capital".

In four out of the five reports, the German wording of "Wissensbilanz", translated "intellectual capital report", and these reports fell under the category of "supplementary reports". In one case the intellectual capital report was included in the annual report of the hospital without the use of a supplementary report.

A description of the extent and quality of provided information as well as the results according the fulfillment of certain criteria for valuation is ensued in the following chapters and will be followed by the interpretation of the results in separate chapters.

6.1 Extent and quality of disclosure by reporting categories

The research demonstrates that the reports provided most frequently information of the sub-category of "structural capital". Independent of the type of reports, all cases favored structural capital reporting. The least frequently reported sub-category was relational capital, with one exception. Itemized statements for the different hospital reports are shown in the tables 4 - 8.

Table 4: Disclosure performance of sub-categories by Heiligenfeld 2006

Hospital/ Type of report	Sub-category	Frequency			Sum	Weighted
		1	2	3		
Heiligenfeld 2006/ Wissensbilanz-Made in Germany	Human capital	10	20	31	61	143
	Structural capital	28	41	56	125	278
	Relational capital	6	21	37	64	159
	Total	44	82	124	250	580

Source: own calculation

Table 5: Disclosure performance of sub-categories by Heiligenfeld 2009

Hospital/ Type of report	Sub-category	Frequency			Sum	Weighted
		1	2	3		
Heiligenfeld 2009/ Wissensbilanz-Made in Germany	Human capital	25	33	15	73	136
	Structural capital	55	105	22	182	331
	Relational capital	8	32	24	64	144
	Total	88	170	61	319	611

Source: own calculation

Table 6: Disclosure performance of sub-categories by HELIOS 2006

Hospital/ Type of report	Sub-category	Frequency			Sum	Weighted
		1	2	3		
HELIOS 2006/ Supplemental report without framework	Human capital	17	26	13	56	108
	Structural capital	54	80	60	194	394
	Relational capital	2	22	3	27	55
	Total	73	128	76	277	557

Source: own calculation

Table 7: Disclosure performance of sub-categories by HELIOS 2011

Hospital/ Type of report	Sub-category	Frequency			Sum	Weighted
		1	2	3		
HELIOS 2011/ Annual report	Human capital	1	13	21	35	90
	Structural capital	11	37	15	63	130
	Relational capital	1	6	15	22	58
	Total	13	56	51	120	278

Source: own calculation

Table 8: Disclosure performance of sub-categories by University Hospital Zurich 2011

Hospital/ Type of report	Sub-category	Frequency			Sum	Weighted
		1	2	3		
University Hospital Zurich 2011/ Supplemental report without framework	Human capital	4	7	13	24	57
	Structural capital	13	25	9	47	90
	Relational capital	3	11	3	17	34
	Total	20	43	25	88	181

Source: own calculation

Especially after the weighting according to the quality of disclosure, the results show clearly that structural capital was by far the top item of the reported information with a range of share from 47 % to 71 %. The distribution of share is shown in the following figure 6.

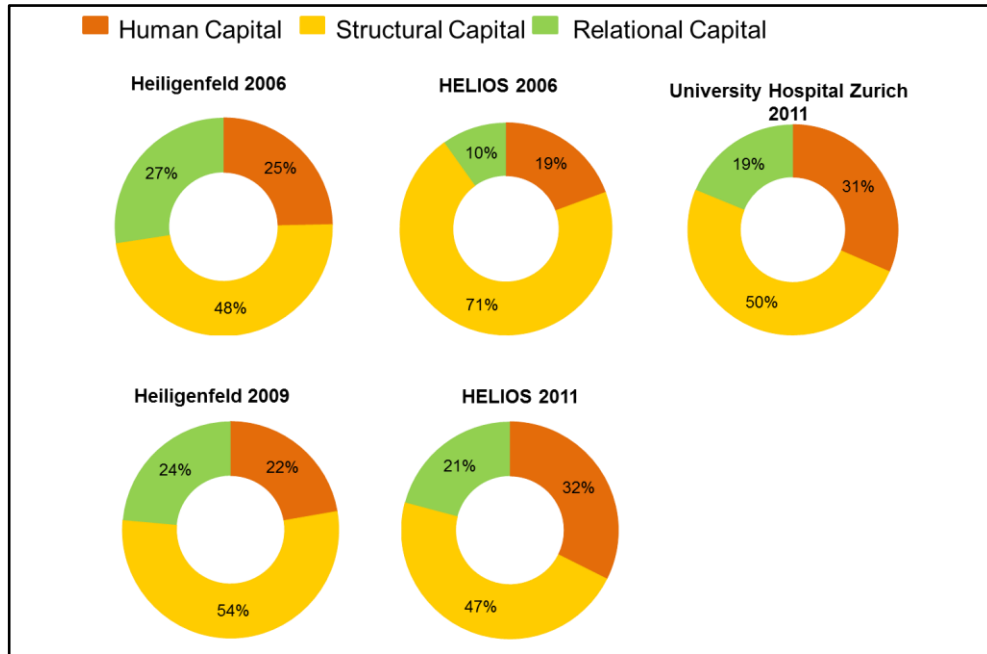


Figure 6: Share of information disclosure by sub-categories, source: own calculation

With regard to the quality of disclosure, the research results show more variety among the sub-categories. The form of disclosure with the highest quality (3) occurs when the indicator is expressed in a factual way and using narratives supported with either numbers (monetary or nonmonetary) or visual images and/ or there is a direct link to added value. This strongly descriptive attributed form was used in different amounts to provide information related to the sub-categories among the hospital reports.

A strong position was again indicated for structural capital which was mentioned 56 respectively 60 times with the highest quality in two reports (see table 4 and table 6). However, in another report relational capital was the sub-category with the highest amount (24 times) of strongly descriptive information (see table 5). The other two hospital reports were indicating the highest quality of disclosure in the sub-category of human capital with an amount of 21 respectively 13 times (see table 7 and 8).

In regard to the frequency of form of disclosure, the research shows that most of the indicators were expressed in narrative rather than in numerical or monetary terms. Almost all reports had the highest frequency in the category with medium quality, attributed as descriptive, where the indicator is discussed without using another indicator but without support of numbers or visual images (see tables 5 -8).

A very interesting exception builds upon the first report done by Heiligenfeld GmbH in 2006. In this case, the form of disclosure with the highest level of quality, i.e. using narrative with numbers or visual images, was reported most frequently (see table 4). Furthermore, in this report the direct relationship between the mission statement, several indicators of intellectual capital as value drivers and the outcome is illustrated. For every component of intellectual capital a separate illustration of a value added chain shows how the input of intellectual capital leads to a certain positive outcome (Heiligenfeld, 2006, pp. 23ff). The following figure 7 depicts the three value added chains disclosed by the hospital.

Mission statement		
Value driver human capital Good working condition Social responsibility Employee qualification Social competence Employee motivation Leadership competence Relationship competence Corporate culture Consequence Enthusiastic employees Committed and motivated employees Inspiring leaders Outcome High quality treatment Good image Customer satisfaction Employee satisfaction	Value driver structural capital Corporate culture Cooperation and communication IT Knowledge transfer Process organisation Leadership process Consequence Learning and knowing organisation Transparency Standardizing Process optimization Outcome Innovation capability Efficiency Efficacy Independency from single employees	Value driver relational capital Social responsibility Value awareness Customer satisfaction Quality of treatment Relationship to public Relationship to payers Relationship to referring physicians Consequence Good relationship to partners, referring physicians, public and payers Outcome Good occupational rate Increased demand Attractivity as employer Positive image Initiator in public and economy Trade mark "Heiligenfeld"

Figure 7: Value added chains of Heiligenfeld GmbH, source: Heiligenfeld, 2006, pp. 23-26, translated by the author

The explicit mentioning of key value drivers which lead to a certain outcome is outstanding compared to the other reports where information on intellectual capital is provided. Following these assumptions of relationships it would be possible to illustrate which key value driver leads to which (business) outcome. However, there is considerable uncertainty how the hospital is able to derive these value added chains. Although the chains seem to be

plausible, it is only stated that there is this clear relationship without sufficient proof to back this claim.

6.2 Extent and quality of disclosure by reporting indicators

The results of the research show some variation of indicators with the highest information content found in the reports. By far the highest number of disclosure for an indicator was 53 (weighted 121) for "knowledge-based infrastructure". The top indicators for human capital were "social competence" of employees, "development" of employees, and "human resources". In the sub-category of structural capital, the indicators for "corporate/ organisational culture", "procedures/ concepts", "knowledge-based infrastructure", and "knowledge transfer" were mentioned with most disclosed information. The indicators with highest information content in the sub-category of relational capital were "stakeholder relationship", "patient satisfaction", and "networking". A table-based representation of the results is shown below for every report.

Table 9: Heiligenfeld 2006: Indicators with most information disclosed

Sub-category	Reported indicator	Frequency			Sum	Weighted
		1	2	3		
Human Capital	Social competence	0	4	12	16	44
Structural Capital	Corporate/ organisational culture	1	8	13	22	56
Relational Capital	Stakeholder relationship	0	5	25	30	85

Source: own calculation

Table 10: Heiligenfeld 2009: Indicators with most information disclosed

Sub-category	Reported indicator	Frequency			Sum	Weighted
		1	2	3		
Human Capital	Social competence	0	4	4	8	20
Structural Capital	Procedures/ Concepts	10	20	0	30	50
Relational Capital	Patient satisfaction	1	5	5	11	26

Source: own calculation

Table 11: HELIOS 2006: Indicators with most information disclosed

Sub-category	Reported indicator	Frequency			Sum	Weighted
		1	2	3		
Human Capital	Development	3	8	2	13	25
Structural Capital	Knowledge-based infrastructure	10	18	25	53	121
Relational Capital	Networking	1	6	1	8	16

Source: own calculation

Table 12: HELIOS 2011: Indicators with most information disclosed

Sub-category	Reported indicator	Frequency			Sum	Weighted
		1	2	3		
Human Capital	Development	0	3	6	9	24
Structural Capital	Knowledge-based infrastructure	0	2	7	9	25
Relational Capital	Patient satisfaction	0	1	6	7	20

Source: own calculation

Table 13: University Hospital Zurich 2011: Indicators with most information disclosed

Sub-category	Reported indicator	Frequency			Sum	Weighted
		1	2	3		
Human Capital	Human resources	1	2	11	14	38
Structural Capital	Knowledge transfer	3	6	3	12	24
Relational Capital	Networking	0	7	3	10	23

Source: own calculation

6.2.1 Interpretation of results by reporting categories and indicators

The present study is based on the assumption that the extent of information disclosed reflects the importance of different categories of information reported by an entity (Krippendorff, 1980, p. 21) as well as that the quality of the information which is represented in the richness of displayed information (Husin et al., 2012, p. 211), and is in turn another indication for the relevance of the reported information. In other words it is implied that the higher the extent and the quality of provided information the more important the information. Consequently, the higher the importance of the information the higher the probability that the disclosure contains information on value drivers and/ or on competitive advantage.

The first finding of the research is that the sub-category with the highest number of disclosed indicators is, after the weighting according to the quality of disclosure, also the category with most disclosed information. This does not mean that the rating of the richness of information is not needful and valuable in the present study. It rather shows that the relative importance of a sub-category shown by extent of information is strengthened by the chosen form of disclosure.

Interestingly, the sub-category with the highest information content (structural capital) is not in every case the one which has the highest number of strongly descriptive from of disclosure, i.e. with the highest quality. This is similar to other intellectual capital reporting studies where a high frequency rate of disclosure is not always corresponding with a high quality of disclosed information (Yi & Davey, 2010, p. 339) and underpins the necessity of a rating of quality in the present study. In two cases, the highest number of strongly

descriptive form of disclosure could be found in the sub-category of human capital. Indeed, it could have been expected an even further focus on human capital as it has been identified as the "most valuable asset" in previous studies (Petty & Guthrie, 2000, p. 165). Habersam and Piber (2003) also found, in one of the two examined hospitals in their qualitative study, that primarily human capital, which is especially based on professional experience, further personal training and communicative abilities, is the main part of intellectual capital and is therefore of high importance (pp. 760ff). Regarding the most frequent indicator published in the present study this result can be confirmed in so far as social competencies and employee development were the top indicators disclosed in the sub-category of human capital. Interestingly, the focus of published information about human capital in the University Hospital Zurich was on the indicator of human resources, which stands for mentioning explicitly certain employees as part of the intellectual capital. Here is again the risk included, that intellectual capital might get lost in case these valuable employees are leaving the organisation. To avoid this kind of risk hospitals could make use of non-disclosure agreements like in other industries.

In regard to the interpretation of the (weighted) amount of provided information, two different approaches can be taken. Firstly, the form of counting the number of analysis units within a category and its total amount, or secondly examine the proportion of volume of disclosure related to the total disclosure (Unerman, 2000, p. 674).

According to the first approach, the research shows that the overall amount of information disclosure varied considerably among the examined reports ranging from 181 to 511 units of information. The least information was provided by the case of University Hospital 2011 which published a supplemental report without using a framework. Most of the information was provided in the case of Heiligenfeld 2009 which made use of the framework from consortium Wissensbilanz. Though both hospitals see intellectual capital as a key success factor for future business success and enterprise value (UniversitätsSpital Zürich, 2012, p. 4; Heiligenfeld GmbH, 2010, p. 4) the information content differs noticeably.

Interestingly, in the annual report of HELIOS 2011, which just included the intellectual capital report, had more relevant information integrated than in the

supplemental intellectual capital report of the University Hospital Zurich 2011. Nevertheless, this is not a very surprising result as HELIOS has on the one side a long experience in publishing information on intellectual capital and on the other side it is a strategic goal of HELIOS to be a "knowledge group" (HELIOS, 2012, p. 35).

However, more important than the total amount of provided information seem to be the second approach for interpretation, namely the ratio of disclosed information of sub-categories to the total disclosure.

In this sense, a very homogenous result is displayed in the research (as shown in the previous illustration 6) in favor of structural capital. The results show that among structural capital especially the indicators for "knowledge-based infrastructure" and "knowledge transfer" had high scores. This supports the idea that "the competitive advantage of organizations does not come from knowledge itself, but from the ability to make knowledge productive." (Stam, 2007, p. 631) Knowledge transfer has another advantage worth mentioning, namely that the intellectual capital from one person can be transmitted to another. This reduces the risk of losing intellectual capital when employees are leaving the hospital.

Even though in two cases a higher number of strongly descriptive forms of disclosure were provided in human capital this did not change the dominance of structural capital in the overall result. In the second hospital of the previous mentioned study of Habersam and Piber (2003) this was also the result by addressing primarily structural capital as the main part of intellectual capital, which was above all embodied in different organisational systems or standards (p. 772ff). The highest scores for the indicators in structural capital in "knowledge-based infrastructure" and "concepts/ procedures" in three cases of the present study confirm this result. However, this is in contrast to the opinion of Edvinsson and Malone (1997, p. 145f) who state that the desired outcome is dependent on an equal distribution of the components.

Regarding to relational capital, the research shows that less the image or reputation of the hospitals have priority, which is in contrast to Habersam and Piber (2003, p. 761), but a good relationship to stakeholders like referring physicians or payers as well as networking is important. Not surprisingly patient satisfaction ranked also high among relational capital, as patients are seen as central stakeholders.

According to the assumption described above, the overall picture leads to the summary that the structural capital of the examined cases seems to play relatively the most important role and the key value drivers and added value could be found in this category.

Not neglectable, however, is the aspect that although hospitals can take advantage from the disclosure of information to the public there is also the risk included that competitors may benefit from the information (Yi & Davey, 2010, p. 341). Furthermore, there could be some inconsistency between external available information and an organisation's internal issues regarding intellectual capital. Strategically important information could be kept internally as well as factors about management challenges and other difficulties regarding intellectual capital (Guthrie & Abeysekera, 2006, p. 13). Due to these reasons, the issue of not or non-adequately providing information in voluntary disclosure has to be taken into account.

However, the analysis showed that the structure and the content of some reports dealt already with issues related to poor performing intellectual capital factors (see for more detail the following chapter). Additionally, it can be assumed that taking the effort for measuring, valuating and publishing the information on intellectual capital would only be taken, if the hospital is willing to increase transparency and not to hide important information.

6.3 Performance review of reports for valuation

The performance of reports was reviewed according to requirements for assessing corporate value set by financial analysts. A detailed explanation of the requirements is provided in chapter 2.3.1. The present analysis shows whether or not the examined reports fulfill these demanded requirements. In the following table 14 the research results are summarized.

Table 14: Review of intellectual capital reports according to requirements of financial analysts

Reports/ Requirements	Summary	Data related to market and industry	Business strategy in relation to IC	List of relevant IC factors	Status quo of IC	Measures for poor performing IC factors	Number of pages below 20
Heiligenfeld 2006 (Wissensbilanz-Made in Germany)	Yes	Yes	Yes	Yes	Yes	Yes	No
Heiligenfeld 2009 (Wissensbilanz-Made in Germany)	Yes	Yes	Yes	Yes	Yes	Yes	No
HELIOS 2006 (supplementary report without framework)	Yes	Yes	Yes	Yes	Yes	No	No
HELIOS 2011 (annual report)	Yes	Yes	No	No	Yes	No	No
University Hospital Zurich 2011 (supplementary report without framework)	Yes	Yes	Yes	Yes	Yes	No	No

Source: own compilation

The research results in regard to the demanded requirements by financial analysts show that the majority of requirements are fulfilled. All of them provide a summary of key points. This has the specific advantage of getting a quick insight of the reported information. Due to the fact that the premise of length of reports, which should not exceed 20 pages, is not met by any of the provided reports, a summary can be very helpful for valuation.

A description of the business environment by disclosing data on market situation and industry has been shown by all reports. All hospitals named their main activities and at least mentioned an increase competition within the market. Additionally, the description and explanation of the business strategy in relation with intellectual capital was given in all supplementary reports. This is of special importance because information disclosure on business environment and strategy is essential for independent publications (Alwert et al., 2009, p. 359).

Furthermore, all supplementary reports listed the relevant intellectual capital factors including an organisation specific definition, or at least a description. One of the reports even provided value-added chains for the three components of intellectual capital (as shown in figure 7).

Not surprisingly all intellectual capital reports did express the status quo of IC. As shown in the previous chapters, data on the current status quo of intellectual capital includes indicators for analysis in the form of qualitative description but also in a quantitative way by being expressed in (monetary and non-monetary) numbers. However, the more preferred way of disclosure by analysts, i.e. a quantitative one, was only provided in to a limited extent. These findings are not unexpected due to the fact that a quantification of qualitative information might give rise to an inaccurate meaning (Yi & Davey, 2010, p. 340).

Measures for utilization and development of poor performing intellectual capital factors have only been published by reports using the framework of the consortium Wissensbilanz.

Even though it was stated by HELIOS that the intellectual capital report is included in their annual report since 2008, this kind of report was lacking to fulfill the most of the demanded requirements of financial analysts. However, the relevant information which is provided in the annual report is shown in the

previous chapters of research results, but it is still short of a structured way of disclosure.

6.3.1 Interpretation of performance review of reports for valuation

Even though the mentioned requirements for intellectual capital reporting are derived from a study, which is not focused on the health care market (Alwert et al., 2009, p. 354) the premises can be applied to hospitals as well. Especially the reports which are using the framework of the consortium Wissensbilanz fulfilled all of the required criteria, except the length of the report.

It can be stated that some of the reports could be a valuable tool to increase the transparency and allow a better decision making of financial analysts regarding the valuation of a hospital. The value of a hospital is determined by the benefit it can generate in the future which is, among others, dependent on existing success factors and employees (Albat & Patzak, 2010, online). Consequently, the inquiry into the current situation regarding intellectual capital is important. The status quo of intellectual capital was identifiable from all reports.

However, an even more crucial role than the assessment of the status quo plays the future development of an organisation (Alwert et al., 2009, p. 364). In this sense, the future orientation by disclosing the business strategy related to intellectual capital as well as measures for poor performing intellectual capital factors gains in importance.

Reports using the "Wissensbilanz- Made by Germany" approach differ positively compared to the other reports by displaying also planned measures to improve intellectual capital. Worth mentioning is that reports using the "Wissensbilanz- Made by Germany" approach show at least quantitative, though not monetary terms in the form of scores of the different intellectual capital elements. This allows not only a comparison of status quo, but also the development in different areas.

Indeed, it could be summarized that information disclosure on intellectual capital, especially reports using the framework of the consortium Wissensbilanz, could help to reduce the information asymmetry between hospitals and financial analysts and allow a more homogenous evaluation. This does not necessarily mean that information disclosure on intellectual

capital would lead to a better valuation of the hospitals, but rather to a more appropriate one. By reducing the information asymmetry between hospitals and financial experts also reduces the risk of wrong (investment) decisions. In this sense, a positive effect can be generated in the valuation process by making use of intellectual capital reporting.

However, there are also some noticeable limitations regarding the usage of intellectual capital reporting. When taking into account that the provided information should be included into a business valuation method like the discounted cash-flow approach the reports reach their limits. As for this approach a prognosis on future financial surplus is required (Albat & Patzak, 2010, online), the analyzed reports could on the one hand function as a support for the determination of value drivers. On the other hand also a lack of certain factors could be identified when including such reports into the valuation process.

7 Conclusion

Significant changes in the German hospital market require appropriate reactions of health care providers. Within a changing health political framework, hospitals have to provide medical treatment at the highest level of quality, competition among hospitals increases and, at the same time, monetary resources are restricted. This leads to a market which is in transition and the trends of privatization, consolidation and a rising need for external capital become apparent. Therefore, the business valuation of hospitals accompanied with the appropriate disclosure of information to reduce investment risks are expected to gain in significance in the years ahead.

Hospitals, like other knowledge-intensive organisations, are today more dependent than ever before on intellectual capital. Intellectual capital consists of non-physical (i.e. intangible) sources of knowledge used for value creation for key stakeholders related to the presence of human, structural and relational capital. It "is now acknowledged as the major contributor to the market value of many companies operating in service and knowledge industries, yet it is generally not reflected on the[ir] balance sheet." (Beattie & Thomson, 2007, p. 159) The statement shows that there is a non-neglectable discrepancy of the visible value of an organisation based on a traditional financial view and the actual one which includes the intellectual capital.

However, there are possibilities to disclose information on intellectual capital in supplementary or annual reports in order to reduce the lack of information on key value drivers. By referring to the increasing amount of publications for the management of intellectual capital in organisations, the actuality of the topic becomes perceptible. However, the special field of interest- hospitals- is lacking studies regarding the subject.

As an explanatory research regarding intellectual capital disclosure in national and international hospitals, this study tries to fill the gap of limited research with respect to intellectual capital reporting in the respective field.

The aim of the present thesis was to answer the questions of "How is intellectual capital measured and displayed in hospitals?", "Are current intellectual capital valuation and reporting tools used in hospitals appropriate

to measure the added value by intellectual capital and the contribution to business success?", "How can the disclosure of intellectual capital influence the enterprise value of a hospital and its valuation?" and "Can a positive effect on external investments be generated?". Especially the questions on the added value gained by intellectual capital and the effects on the valuation of a hospital are important to answer in respect to the fact that "[intellectual capital] is not valuable for what it is but for its effects and for what it triggers." (Habersam & Piber, 2003, p. 772)

This study is based on data gathered by five external available reports of hospitals comprising information on intellectual capital. It contains reports during the period 2006 - 2011. The analysis includes both an examination of extent and quality of intellectual capital disclosure through the usage of content analysis and a disclosure index derived from previous studies and aligned to the special field of interest. Additionally, the reports were analyzed whether or not certain requirements set by financial analysts for valuation of organisations are met.

The research demonstrates, that the current level of external available intellectual capital reports of hospitals can be described as low. Although hospitals can be characterized as highly knowledge-intensive organisations and the measurement and management of intellectual capital is of high relevance, the disclosure on the respective information is limited (yet).

One of the examined intellectual capital reports attempted to illustrate the direct relationship of certain key value drivers via consequences to the outcome on the bases of value added chains. The input factors of intellectual capital as well as the demonstrated outcome seems to be plausible, but in fact the proof of the statements is missing.

By taking the amount of published information as a basis of relative importance of disclosure, a clear picture can be drawn in favor of structural capital. This result is underpinned by the fact that indicators for structural capital have not only been mentioned with the highest frequency, but in total also with the highest level of quality of disclosure.

The analysis showed that the information on intellectual capital was disclosed mainly in a qualitative narrative way, without using other indicators to explain the respective indicator and without the support of visual images or numbers.

This form of disclosure is attributed as descriptive attributed and reference or comments to facts are made which can be proven. Although the main information was provided in this form, an effort was made to display the (probably) most important information also in a strongly descriptive way by making use of figures to express the indicator and/ or mentioning a direct link between the indicator and the added value achieved by it.

Regarding the fulfillment of the reports of requirements concerning content and structure of intellectual capital disclosure set by financial analysts, the conclusion can be derived that the majority of reports met the respective preconditions. This does not necessarily mean that information disclosure on intellectual capital would lead to a better valuation of the hospitals in terms of a higher enterprise value. It rather would increase the appropriateness of the valuation. The information asymmetry between hospitals and financial experts could be reduced and, in further consequence, this can lead to a reduced risk of wrong decisions, especially in regard to investments. This might be considered as creating a positive effect on the valuation of a hospital, even though the link between the provided information and a derivation of expected future cash flows could not be shown in the present study. Indeed, the importance for auditors or other financial analysts to get relevant information on intellectual capital seems crucial to estimate the future potential of a hospital and to identify competitive advantages. Additionally, also the hints for a lack of certain elements of intellectual capital might also be valuable information for financial experts.

The conclusion of the present thesis should be considered after taking into account the following limitations: Firstly, there was a limited amount of reports which were analyzed and restricted to external available reports comprising information on intellectual capital (supplementary intellectual capital reports and an annual report which included the intellectual capital report). Results could vary if additional forms of publications of about hospitals were scrutinized (e.g. press releases, content of websites, academic publications). Secondly, despite the fact that the coding process was performed systematically with utmost care, there could have been errors in coding due to coder bias. Thirdly, although the disclosure index in use was based on in-depth literature research and previous studies to reach the most suitable classification for the special field of interest, the index may not be exhaustive.

In closing, the evaluation of the situation on the basis of research results reveals the following conclusion: an awareness of hospitals concerning the three relevant components of intellectual capital (human capital, structural capital and relational capital) seems to be present. A direct deduction of added value gained from intellectual capital and in further consequence a prediction of future cash flow cannot be shown in the present stage. The disclosure of information on intellectual capital can have a positive effect in the valuation of a hospital in the sense that it contributes to a more appropriate value and reduces the lack of information concerning future potentials but also future risks.

8 Limitations of study and outlook

It is debatable whether the methods used in this study are sound for measuring the added value gained by intellectual capital since the measures are not based on financial information. However, at this point of time there are no direct solutions available for measuring the value added of intellectual capital, especially not in field of hospitals, therefore an indirect way has to be taken.

Although the method of content analysis is the most popular one in IC reporting studies there are some limitations regarding the method. When content analysis is used there is always a judgment being made by the coder. A lack of well-specified decision categories and decision rules leads to a reliability issue. The interpretation of information could be different by another coder at another time and this decreases the reliability of the results (Husin et al., 2012, p. 216; Beattie & Thomson, 2007, p. 139).

The units of analysis have been text units instead of sentences to reduce the risk of information loss due to an otherwise required subjective decision on the dominant piece of information. In this sense also the issue of subjectivity is reduced. In regard to decision categories, the disclosure index has been conducted based on in-depth literature research in the field of intellectual capital reporting with focus on hospitals as the subject of studies. However, a limited amount of empirical data on intellectual capital in hospitals may reduce the exhaustiveness of indicators for this field.

This leads to the outlook that in the research area of hospitals, intellectual capital has still some efforts to be put in and further research that extends the ideas shown in the present thesis is essential.

Due to a limited number of external available intellectual capital reports of hospitals a possible approach could be in following the examples of other industries in analyzing only annual reports instead. Furthermore, to reduce the risk of possible inconsistency between external available information and internal issues on intellectual capital, a combination of methodologies is conceivable to enrich the information gathered via content analysis by using qualitative interviews with representatives of the hospitals.

9 List of references

- Abbott, W.F. and Monsen, R.J. (1979) 'On the Measurement of Corporate Social Responsibility: Self-Reported Disclosures as a Method of Measuring Corporate Involvement'. *The Academy of Management Journal*, Vol. 22 (3), pp. 501 – 515.
- Abeysekera, I. (2011) *Reputation Building, Website Disclosure and the Case of Intellectual Capital*. Studies in Managerial and Financial Accounting. Vol. 21. United Kingdom: Emerald Group Publishing Limited.
- Albino, V., Garavelli, A.C. and Gorgoglione, M. (2004) 'Organization and technology in knowledge transfer'. *Benchmarking: An International Journal*, Vol. 11 (6), pp. 584 – 600.
- Alwert, K., Bornemann, M. and Will, M. (2009) 'Does intellectual capital reporting matter to financial analysts?'. *Journal of Intellectual Capital*, Vol. 10 (3), pp. 354 – 368.
- Arbeitskreis Wissensbilanz (Consortium on Intellectual capital statement) (2013) The research group "Arbeitskreis Wissensbilanz" [online] available from: <http://www.akwissensbilanz.org/arbeitskreis-en.htm>. [Accessed February 12, 2013].
- Arbeitskreis Wissensbilanz (Consortium on Intellectual capital statement) (2004) *Intellectual capital statement - Made in Germany. Guideline 1.0*. Berlin: Federal Ministry of Economics and Labour.
- Argote, L. and Ingram, P. (2000) 'Knowledge Transfer: A Basis for Competitive Advantage in Firms'. *Organizational Behavior and Human Decision Processes*, Vol. 82 (1), pp. 150 – 169.
- ASCG (Accounting Standards Committee of Germany) (2012) *Deutscher Rechnungslegungs Standard Nr. 20 (DRS 20) Konzernlagebericht*. Berlin.
- Augurzký, B., Gülker, R., Krolop, S., Schmidt, C.M., Schmidt, H., Schmitz, H. and Terkatz, S. (2011) *Krankenhaus Rating Report 2011: Die fetten Jahre sind vorbei. Executive Summary*. Essen: Rheinisch-Westfälisches Institut für Wirtschaftsforschung.
- Augurzký, B., Krolop, S. and Weiler, S. (2012a) *Krankenhaus Rating Report 2012: Immer mehr Kliniken im "roten Bereich"* [online] Press release: June

- 14, 2012. Available from: <http://www.rwi-essen.de/presse/mitteilung/89/>. [Accessed January 29, 2013].
- Augurzký, B., Beivers, A. and Gülker, R. (2012b) Bedeutung der Krankenhäuser in privater Trägerschaft. Essen: Rheinisch-Westfälisches Institut für Wirtschaftsforschung.
- Sveiby, K.-E. (2001) In: Barcelo, M. (2001) Hacia una economía del conocimiento. Madrid: ESIC Editorial PriceWaterhouseCoopers
- Beattie, V. and Thomson, S.J. (2007) 'Lifting the lid on the use of content analysis to investigate intellectual capital disclosures'. Accounting Forum, No. 31, pp. 129 – 163.
- Berger, H. and Stock, C. (2008) Grundlagen der Gesundheitsökonomie und Gesundheitspolitik. In: Schmidt-Rettig, B. and Eichhorn, S. (ed.) Krankenhaus- Managementlehre - Theorie und Praxis eines integrierten Konzepts. 1st ed. Stuttgart: Kohlhammer.
- Blanc-Brude, F., Goldsmith, H. and Väilä, T. (2006) Ex ante construction costs in the European road sector: A comparison of public-private-partnerships and traditional public procurement. Economic and Financial Report 2006/1. Luxembourg: European Investment Bank.
- Bontis, N. (1996) In: Kristandl, G. and Bontis (2007) 'Constructing a definition for intangibles using the resource based view of the firm'. Management Decision: Strategic business valuation, Vol. 45 (7), pp. 1520 – 1524.
- Bontis, N. (2001) Managing Organizational Knowledge by Diagnosing Intellectual Capital: Framing and Advancing the State of the Field. In: Malhotra, Y. (ed.) Knowledge Management and Business Model Innovation. London: Idea Group Publishing.
- Bornemann, M. and Alwert, K. (2007) 'The German guideline for intellectual capital reporting: method and experiences'. Journal of Intellectual Capital: Strategic Enterprise Valuation. Vol. 8(4), pp. 563 – 576.
- Brooking, A. (1996) Intellectual Capital: Core Assets for the Third Millennium Enterprise. London: Thomson Business Press
- Busse, R. and Reisberg, A. (2004) Health Care Systems in Transition: Germany. WHO Regional Office for Europe on behalf of the European Observatory on Health Systems and Policies. Copenhagen.

- Dalkir, K. (2011) Knowledge Management in Theory and Practice. 2nd ed. Chambridge: MIT Press.
- Danish Agency of Trade and Industry (DATI) (2000) A Guideline for Intellectual Capital Statements - A Key to Knowledge Management. Ministry of Trade and Industry. Copenhagen.
- Dewulf, G. and Wright, S. (2009) Capital financing models, procurement strategies and decision-making. In: Rechel, B., Wright, S. and Edwards, N. (ed.) Investing in Hospitals of the Future. WHO Regional Office for Europe. Albany, NY, USA.
- DKG (Deutsche Krankenhaus Gesellschaft) (2012) Bestandsaufnahme zur Krankenhausplanung und Investitionsfinanzierung in den Bundesländern. Berlin
- Drucker, P.F. (1999) 'Knowledge-Worker Productivity: The Biggest Challenge'. California Management Review, Vol. 41 (2), pp. 79 – 94.
- Edvinsson, L. and Malone, M.S. (1997) Intellectual Capital: Realizing your Company's True Value by Finding Its Hidden Brainpower. New York: HaperCollins Publisher.
- Edvinsson, L. and Bounfour, A. (2004) Assessing national and regional value creation. In: Marr, B. (ed.) Measuring Intangible Assets - The State of the Art. Bradford, GBR: Emerald Group Publishing Ltd.
- Edvinsson, L. and Kivikas, M. (2007) 'Intellectual capital (IC) or Wissensbilanz process: some German experiences'. Journal of Intellectual Capital, Vol. 8 (3), pp. 376 – 385.
- EFFAS CIC (EFFAS Commission on Intellectual Capital) (2008) Principles for Effective Communication of Intellectual Capital. Towards Valuation, Measurement and Disclosure. The European Federation of Financial Analysts Societies. Frankfurt am Main.
- European Commisssion (2006) Reporting Intellectual Capital to Augment Research, Development and Innovation in SMEs (RICARDIS). Report to the Commission of the High Level Expert Group on RICARDIS. Luxembourg: Office for Official Publications of the European Communities.
- Federal Bureau of Statistics (2012a) Statistisches Jahrbuch: Kapitel 4 Gesundheit. Wiesbaden.

- Federal Bureau of Statistics (2012b) Gesundheit: Grunddaten der Krankenhäuser 2011. Fachserie 12 Reihe 6.1.1. Wiesbaden.
- Federal Bureau of Statistics (2013a) Erwerbstätige. [online] available from: <https://www.destatis.de/DE/ZahlenFakten/GesamtwirtschaftUmwelt/Arbeitsmarkt/Erwerbstaetigkeit/Erwerbstaetigenrechnung/Tabellen/ArbeitnehmerWirtschaftsbereiche.html>. [Accessed February 5, 2013].
- Federal Bureau of Statistics (2013b) Volkswirtschaftliche Gesamtrechnungen. Inlandsproduktsberechnung. Erste Jahresergebnisse. Fachserie 18 Reihe 1.1. Wiesbaden.
- Frederick, W.R. (2009) Recent Developments in Intellectual Capital Reporting and their Policy Implications. OECD Education Working Papers. No. 17. Paris: OECD Publishing.
- Fries, T. (2003) Unternehmensbewertung von Krankenhäusern. Arbeitsberichte zum Management im Gesundheitswesen. Arbeitsbericht Nr. 3. Köln.
- Geissler, A., Quentin, W., Scheller-Kreinsen, D. and Busse, R. (2011) Introduction to DRGs in Europe: Common objectives across different hospital systems. In: Busse, R., Geissler, A., Quentin, W. and Wiley, M. (ed.) Diagnosis-Related Groups in Europe. Moving towards transparency, efficiency and quality in hospitals. WHO Regional Office for Europe on behalf of the European Observatory on Health Systems and Policies. Copenhagen.
- Guthrie, J. (2001) 'The management, measurement and the reporting of intellectual capital'. Journal of Intellectual Capital, Vol. 2 (1), pp. 27 – 41.
- Guthrie, J., Petty, R. and Yongvanich, K. (2004) 'Using content analysis as a research method to inquire into intellectual capital reporting'. Journal of Intellectual Capital, Vol. 5 (2), pp. 282 – 293.
- Guthrie, J and Abeysekera, I. (2006) 'Content analysis of social, environmental reporting: What is new?'. Journal of Human Resource Costing & Accounting, Vol. 10 (2), pp. 114 – 126.
- Guthrie, J., Ricceri, F. and Dumay, J. (2012) 'Reflections and projections: A decade of Intellectual Capital Accounting Research'. The British Accounting Review, No. 44, pp. 68 – 82.

- Habersam, M. and Piber, M. (2003) 'Exploring intellectual capital in hospitals: two qualitative case studies in Italy and Austria'. *European Accounting Review*, Vol. 12 (4), pp. 753 – 779.
- Haubrock, M. (2009) Aspekte der Krankenhausfinanzierung. In: Haubrock, M., Schär, W. (ed.) *Betriebswirtschaft und Management in der Gesundheitswirtschaft*. 5th ed. Bern: Huber.
- Heiligenfeld GmbH (2007) Heiligenfeld Wissensbilanz 2006 [online] available from: <http://www.heiligenfeld.de/images/pdf/Heiligenfeld%20Kliniken%20-%20Wissensbilanz%202006.pdf>. [Accessed November 18, 2012].
- Heiligenfeld GmbH (2010) Heiligenfeld Wissensbilanz 2009 – Folgebilanz. [online] available from: <http://www.heiligenfeld.de/files/Archiv/Heiligenfeld%20Kliniken%20-%20Wissensbilanz%202009.pdf>. [Accessed November 18, 2012].
- HELIOS Kliniken GmbH (2012) HELIOS EinBlicke 2011 [online] available from: http://www.helios-kliniken.de/fileadmin/user_upload/Helios-Kliniken.de/Ueber_HELIOS/GB2011/HELIOS_EinBlicke_2011_deutsch.pdf. [Accessed March 1, 2013].
- HELIOS Kliniken GmbH (undated) Archiv. Die Helios Wissensberichte [online] available from: <http://www.helios-kliniken.de/ueber-helios/publikationen/archiv.html>. [Accessed March 1, 2013].
- Hitchner, J.R. (2011) *Valuation of Healthcare Service Businesses*. In: Hitchner, J.R. (ed.): *Financial Valuation*. 3rd ed. New Jersey: John Wiley & Sons, Inc.
- Husin N.M., Hooper, K. and Olesen, K. (2012) 'Analysis of intellectual capital disclosure – an illustrative example'. *Journal of Intellectual Capital*, Vol. 13 (2), pp. 196 – 230.
- INEK (Institut für das Entgeltsystem im Krankenhaus GmbH) (2009) *German Diagnosis Related Groups Version 2010. Definitionshandbuch Kompaktversion*. Siegburg.
- Johnson, H.T. and Kaplan, R.S. (1987) *Relevance Lost*. Boston: Harvard Business School Press.
- Kersting, T. (2008) Struktur und Prozesse der Leistungserstellung. In: Schmidt-Rettig, B. and Eichhorn, S. (ed.) *Krankenhaus-Managementlehre. Theorie und Praxis eines integrierten Konzepts*. Stuttgart: Kohlhammer.

- Kimbrough, M. (2008) Financial Communication in the Life Sciences: Focus on Intellectual Capital Reporting. OECD Workshop on Knowledge Networks and Markets. In: OECD (2012) Knowledge Networks and Markets in Life Sciences. Paris: OECD Publishing.
- Kong, E. (2007) 'The strategic importance of intellectual capital in the non-profit sector'. Journal of Intellectual Capital: Strategic Enterprise Valuation, Vol. 8 (4), pp. 721 – 731.
- Kong, E. (2010) 'Intellectual capital and non-profit organizations in the knowledge economy: Editorial and introduction to special issue'. Journal of Intellectual Capital, Vol. 11 (2), pp. 97 – 106.
- KPMG AG Wirtschaftsprüfungsgesellschaft (2010) Corporate Finance. Intangible Assets and Goodwill in the context of Business Combinations. An industry study. Germany.
- Krippendorff, K. (1980) Content analysis: an introduction to its methodology. Beverly Hills: Sage.
- Krolop, S. (2012) Krankenhausversorgung am Wendepunkt [online] available from:
http://www.accenture.com/SiteCollectionDocuments/Local_Germany/PDF/Accenture-PoV-2012-Krankenhausversorgung-Am-Wendepunkt.pdf
[Accessed January 30, 2013]
- Kujansivu, P. and Lönnquist, A. (2007) 'Investigating the value and efficiency of intellectual capital'. Journal of Intellectual Capital: Intellectual capital reporting, Vol. 8 (2), pp. 272 – 287.
- Lai, M.-C. and Tsay, W.-D. (undated) An Empirical Study on the Relationship between Intellectual Capitals and Performance in a Taiwan Hospital.
- Leitner, K.-H., Sammer, M., Graggober, M., Schartinger, D. and Zielowski, C. (2001) Wissensbilanzierung für Universitäten. Auftragsprojekt für das bm:bwk, Sektion VII, Sektion VIII. Endbericht. Seibersdorf, Leoben.
- Lev, B. (2001) Intangibles: Management, Measurement, and Reporting. Washington, DC: The Brookings Institute.
- Marr, B. and Chatzkel, J. (2004) 'Intellectual capital at the crossroads: managing, measuring and reporting of IC'. Journal of Intellectual Capital: IC at the crossroads: theory and research, Vol. 5 (2), pp. 224 – 229.

- Marr, B., Schiuma, G. and Neely, A. (2004) 'Intellectual capital - defining key performance indicators for organizational knowledge assets'. Business Process Management Journal, Vol. 10 (5), pp. 551 – 569.
- Maarse, H. and Normand, C. (2009) Market competition in European hospital care. In: Rechel, B., Wright, S. and Edwards, N. (ed.) Investing in Hospitals of the Future. WHO Regional Office for Europe. Albany, NY, USA.
- McConnachie, G. and Lung, A. (2008) What is Intellectual Capital Management (ICM)?. Asia Pacific Intellectual Capital Centre White Paper #2 [online] available from: <http://www.apicc.asia/wp-content/uploads/2010/08/What-is-ICM.pdf>. [Accessed January 31, 2013]
- MERITUM (2001) Final report MERITUM Project. TSER Programme: Tuscon.
- MERITUM (2002) Guidelines for Managing and Reporting on Intangibles (Intellectual Capital Report). TSER Programme. Tucson.
- Mörsch, M. and Derix, F. (2010) 'Stand der Investitionskostenfinanzierung 2010'. das Krankenhaus, Vol. 8, pp. 731 – 735.
- OECD (2012) Knowledge Networks and Markets in Life Sciences. Paris: OECD Publishing.
- Oliveira, L., Rodrigues, L. and Craig, R. (2010) 'Intellectual capital reporting in sustainability reports'. Journal of Intellectual Capital, Vol. 11 (4), pp. 575 - 594.
- Peng, T-J.A, Pike, S. and Roos, G. (2007) 'Intellectual capital and performance indicators: Taiwanese healthcare sector'. Journal of Intellectual Capital. Vol. 8 (3), pp. 538 – 556.
- Petty, R. and Guthrie, L. (2000) 'Intellectual capital literature review: Measurement, reporting and management'. Journal of Intellectual Capital, Vol. 1 (2), pp. 155 – 176.
- Piening, E.P. (2010) Prozessdynamiken der Implementierung von Innovationen. Eine empirische Analyse dynamischer Fähigkeiten und ihrer Wirkung in Krankenhäusern. Wiesbaden: Gabler.
- Pike, S., Fernström, L. and Roos, G. (2005) 'Intellectual capital. Management approach in ICS Ltd'. Journal of Intellectual Capital. Management: consulting practice of intellectual capital, Vol. 6 (4), pp. 489 – 509.

- Porter, M.E. (2010) ‚What I Value in Health Care?’. The New England Journal of Medicine, Vol. 363 (26), pp. 2477 – 2481.
- Quentin, W., Geissler, A., Scheller-Kreinsen, D. and Busse, R. (2011) Understanding DRGs and DRG-based hospital payment in Europe. In: Busse, R., Geissler, A., Quentin, W. and Wiley, M. (ed.) Diagnosis-Related Groups in Europe. Moving towards transparency, efficiency and quality in hospitals. WHO Regional Office for Europe on behalf of the European Observatory on Health Systems and Policies. Copenhagen.
- Rafiei, M., Ghaffari, H. and Parsapur, R. (2011) ‘Investigating the impact of intellectual capital on organizational performance: A case study in an Iranian medical science university’. African Journal of Business Management, Vol. 6 (9), pp. 3546 - 3552.
- Roos, G., Bainbridge, A. and Jacobson, K. (2007) ‚Intellectual capital analysis as a strategic tool’. Strategy & Leadership, Vol. 29 (4), pp. 21 – 26.
- Schmalenbach Gesellschaft für Betriebswirtschaft e.V. Arbeitskreis "Immaterielle Werte im Rechnungswesen" (2005) Erfassung immaterieller Werte in der Unternehmensberichtserstattung vor dem Hintergrund handelsrechtlicher Rechnungslegungsnormen. In: Horvath, P. & Möller, K. (ed.) Intangibles in der Unternehmenssteuerung. München: Vahlen.
- Schmidt-Rettig, B. (2008) Finanzierung. In: Schmidt-Rettig, B. and Eichhorn, S. (ed.) Krankenhaus-Managementlehre. Theorie und Praxis eines integrierten Konzepts. Stuttgart: Kohlhammer.
- Starovic, D. and Marr, B. (2008) Understanding corporate value: managing and reporting intellectual capital. United Kingdom: Chartered Institute of Management Accountants.
- Stam, C.D. (2007) ‘Making sense of knowledge productivity: beta testing the KP-enhancer’. Journal of Intellectual Capital, Vol. 8 (4), pp. 628 – 640.
- Stewart, T.A. (1997) Excerpt of: Intellectual Capital: The New Wealth of Organizations [online] available from: <http://www.qfinance.com/human-and-intellectual-capital-finance-library/intellectual-capital-the-new-wealth-of-organizations>. [Accessed February 8, 2013].
- Sullivan, P.H. (1998): Profiting from Intellectual Capital. Extracting Value from Innovation. New York: John Wiley & Sons, Inc.

- Sullivan, P.H. (2000) A brief history of the ICM movement. Value-driven Intellectual Capital. How to convert Intangible Corporate Assets into Market Value [online] available from: <http://www.sveiby.com/articles/icmmovement.htm>. [Accessed February 8, 2013].
- Sveiby, K.E. (1997) The New Organizational Wealth: Managing and Measuring Knowledge based Assets. San Francisco: Barrett-Kohler Publishers.
- Teece, D.J. (2000) Managing Intellectual Capital: Organizational, Strategic, and Policy Dimensions. Oxford, GBR: Oxford University Press.
- Tiemann, O., Schreyögg, J. and Busse, R. (2011) 'Hospital ownership and efficiency: A review of studies with particular focus on Germany'. Health Policy, No. 104, pp. 163 – 171.
- Töpfer, A. and Großekathöfer, J. (2006) Analyse der Prozesslandschaft und Prozesssteuerung als Erfolgsvoraussetzung. In: Albrecht, D.M. and Töpfer, A. (ed.) Erfolgreiches Changemanagement im Krankenhaus. 15-Punkte Sofortprogramm für Kliniken. Heidelberg: Springer Medizin Verlag.
- Unerman, J. (2000) 'Methodological issues. Reflections on quantification in corporate social reporting content analysis'. Accounting Auditing & Accountability Journal, Vol. 13 (5), pp. 667 – 680.
- UniversitätsSpital Zürich (2012) Wissensbericht 2011 [online] available from: http://www.usz.ch/SiteCollectionDocuments/Jahresbericht/2011/Wissensbericht_2011.pdf. [Accessed March 1, 2013].
- Van Beveren, J. (2003) 'Does health care for knowledge management?'. Journal of Knowledge Management, Vol. 7 (1), pp. 90 – 95.
- Wedel, S. (2008) Investitionsfinanzierung im Krankenhauswesen. In: Hellmann, W., Baumann, H., Bienert, M.L. and Wichelhaus, D. (ed.) Krankenhausmanagement für Leitende Ärzte. Heidelberg: Economica.
- Wilkesmann, U., Wilkesmann, M. and Virgillito, A. (2007) Requirements for knowledge transfer in hospitals. How can knowledge transfer be supported in hospital? Discussion paper No. 2. Dortmund.
- Ziehe, M. (2009) Innovative Finanzierungsinstrumente im Krankenhaus. Vergleich von Finanzierungsmöglichkeiten zur Umsetzung von Investitionsprojekten in kleinen und mittleren gemeinnützigen

Krankenhäusern in Deutschland anhand eines Fallbeispiels. Frankfurt am Main: Peter Lang GmbH.

Zwirner, C. (2010) Bewertung von immateriellen Werten nach IDW S 5 [online] available from: <http://www.bundesanzeiger-verlag.de/betrifft-unternehmen/finanzen/aktuelles/news-details-fachbeitraege-finanzen/artikel/bewertung-von-immateriellen-werten-nach-idw-s-5.html>. [Accessed April 17, 2013].

Legal references

Directive 2003/51/EC of the European Parliament and of the Council of 18 June 2003 amending Directives 78/660/EEC, 83/349/EEC, 86/635/EEC and 91/674/EEC on the annual and consolidated accounts of certain types of companies, banks and other financial institutions and insurance undertakings. [Online] available from: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2003:178:0016:0022:en:PDF>. [Accessed February 12, 2013].

10 Annex

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Annex I: Disclosure index	A1
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Annex I: Disclosure index

Intellectual Capital					Valuation	
	Human capital		Structural capital		Relational Capital	Requirements of financial analysts
H1	Absence	S1	Achieving mechanism culture	R1	Basic marketing capability	F1 Summary
H2	Attitudes	S2	Administrative processes	R2	Competitive advantage	F2 Data related to market and
H3	Commitment	S3	Certification	R3	Competitors	F3 Business strategy in relationship to
H4	Communicative abilities	S4	Communication systems	R4	CSR activities	F4 Relevant IC factors
H5	Computer literacy	S5	Competitive and market channels	R5	Favourable contracts	F5 Status quo of IC
H6	Creativity	S6	Copyrights	R6	Image	F6 Measures for poor performing IC
H7	Development	S7	Corporate/organisational culture	R7	Horizontal Collaboration	F7 Number of pages below 20
H8	Education	S8	Cultural diversity	R8	Knowledge/acquaintance with community	
H9	Employee expertise	S9	Customer support	R9	Knowledge/acquaintance with government	
H10	Employee flexibility	S10	Databases	R10	Knowledge/acquaintance other	
H11	Employee knowledge	S11	Documentation services	R11	Links with suppliers	
H12	Employee productivity	S12	Financial relations	R12	Market intensity	
H13	Employee satisfaction	S13	Intangible assets	R13	Negotiating capacity with financial entities	
H14	Entrepreneurial spirit	S14	Infrastructure	R14	Networking	
H15	Equality	S15	Innovation	R15	Other Stakeholder satisfaction	
H16	Expert networks	S16	Intellectual property	R16	Patient satisfaction	
H17	Friendliness	S17	Knowledge transference	R17	Reputation	
H18	Further personal/professional	S18	Knowledge-based infrastructure	R18	Research collaborations	
H19	Human resources	S19	Management philosophy	R19	Stakeholder relationship	
H20	Innovative capacity	S20	Management processes	R20	Stakeholder knowledge	
H21	Juristic competence	S21	Networks (internal)	R21	Vertical collaborations	
H22	Know-how (employees)	S22	Operation process			
H23	Learning capacity	S23	Organisational flexibility			
H24	Loyalty to organisation	S24	Organisational learning			
H25	Motivation	S25	Organisational routines			
H26	Personal/professional experience	S26	Organisational structure			
H27	Problem solving capacity	S27	Patents/ patent application			
H28	Recruitment	S28	Patient-centered			
H29	Reflect experiences (previous)	S29	Procedures/ Concepts			
H30	Sensitivity	S30	Process capability			
H31	Skill (employees)	S31	Quality improvements			
H32	Social competence	S32	Quality management			
H33	Staff (employee) profile	S33	Research			
H34	Staff turnover	S34	Specialised software/IT			
H35	Taking responsibility	S35	Transparency			
H36	Teamwork capacity					
H37	Tolerance for ambiguity					
H38	Up-to-date competence					
H39	Vocational qualifications					