

InCaS: Intellectual Capital Management in European SME - Its Strategic Relevance and the Importance of its Certification

Kai Mertins, Wen-Huan Wang and Markus Will
Fraunhofer IPK Berlin, Germany

kai.mertins@ipk.fraunhofer.de

wen-huan.wang@ipk.fraunhofer.de

markus.will@ipk.fraunhofer.de

Abstract: As the Lisbon Agenda declares the aim for the European Union to become the most dynamic and competitive knowledge-based market in the world by 2010, management instruments are needed to support companies achieving this ambitious goal. Small and medium-sized companies (SMEs) are especially affected by this plan being the driving force of Europe's economy. To obtain their competitive advantage, it is crucial for SMEs to utilise knowledge efficiently and to enhance their innovation potential. Thus, managing their specific Intellectual Capital (IC) becomes more and more important for future-oriented organisations.

A practical way to tackle the challenge is the methodology developed by the German pilot project 'Wissensbilanz – Made in Germany' and the European pilot project 'InCaS: Intellectual Capital Statement – Made in Europe'. The Intellectual Capital Statement (ICS) is an instrument to assess, develop and report the IC of an organisation and to monitor critical success factors systematically. By applying this method in more than 50 German and 25 European small and medium-sized enterprises, it was possible to support the participating companies in identifying, evaluating and developing their strategically relevant knowledge.

Resulting from increased interests in managing and reporting of IC, stakeholders such as creditors or investors receive ICS in completely different qualities - from very reliable to implausible. To ensure the quality of ICS in a sustainable way, we have developed an approach of ICS certification based on the methods of quality management system certification, financial audit and the assessment for European Excellence Award. In the end, only the ICS fulfilling the quality requirements will be awarded a certificate. A catalogue with requirements shall serve as the certification basis and has to be in place beforehand. This catalogue evolved as an essence of both above mentioned projects and includes the experiences of ICS implementations. The challenge is to determine the smallest possible amount of requirements that will enable the ICS to meet the acknowledged quality criteria.

Furthermore, this paper summarises how the InCaS method supports companies developing a knowledge-based strategy. We describe research results gained from the German and European project about the strategic relevance of particular IC factors in general and their relevance depending on the business sector.

Keywords: intellectual capital statement audit, knowledge management, innovation, SME, quality requirements, certification

1. Introduction

The methodology 'Wissensbilanz – Made in Germany' was developed by the project consortium 'Arbeitskreis Wissensbilanz' lead by Berlin-based Fraunhofer IPK. The consortium conducted a pilot project to adjust the preparation of Intellectual Capital Statements (ICS) to the German SME situation and to test it practically. The results and the experiences of the project led to the first German Guideline for implementing ICS in SMEs (Alwert, Bornemann, Kivikas 2004). By the end of 2007, more than 50 ICS have been implemented in the course of the project. The German ICS guideline and the supporting software have been retrieved 60.000 times. The intention of InCaS, a project under the European Union's Sixth Framework, is to harmonise the different national ICS approaches and to develop and test this European ICS methodology in 25 SMEs in 5 core countries. National SME associations in those countries act as dissemination partners and aim at the target of 1,000 EU SME's to be using InCaS model and tools by the end of the project (Dec 2008).

At present the statements about IC vary in structure and content. The ICS guideline by the Danish Ministry of Science, Technology and Innovation underscores that external verification is an additional opportunity to check the systematic approach of the process and the credibility of external ICS (DMSTI 2003). The European Commission PRISM report notes that the field of audit still far away from a consensus on how to audit innovative forms of reporting such as ICS (EC 2003). Since there is no audit standard available for ICS (DATI 2000), the financial auditors usually check figures and texts that are in accordance with the auditing firm's guidelines when an audit is required (cf. DMSTI 2003). The RICARDIS report (EC 2006) states that audit for IC reporting can be particularly useful in measuring compliance with mandatory rules and

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regulations, identifying problems to solve and opportunities to seize, reducing risk, avoiding the cost of mistakes, providing reassurance to both financial and non-financial stakeholders. In response to the needs for quality requirements as the foundation for ICS audits, a document called 'Intellectual Capital Statement Quality Requirements - European ICS Guideline' for ICS certification has been developed (EC 2008b). This paper will present the outcome of the research work within the InCaS project and at Fraunhofer IPK with objectives, such as exploring identifying the crucial factors with the most significant effect on ICS implementation success and defining the minimum quality requirements for an ICS audit.

Despite supporting SMEs in managing their Intellectual Capital (IC) effectively both projects allowed collecting valuable data about the perceived strategic importance of different IC factors in European SMEs. The second part of the paper aims to present the results from analysing the obtained data. The main research question was how far companies differ regarding the perceived importance of particular IC factors and if these differences could be explained by the characteristics of the sector they are belonging to.

2. Quality assurance of ICS

To develop a requirement catalogue for certifying ICS, we analysed numerous ICS guidelines for companies in Europe and the accompanying audit activities based on a comparative analysis of non-financial reporting frameworks by the OECD. Table 1 shows the guidelines for specific reporting about intellectual assets for companies in Europe (OECD 2006) and their accompanying audit activities.

Table 1: Selected ICS guidelines and accompanying audit activities (cf. OECD 2006)

Specific reporting about intellectual assets for companies in Europe (e.g. stand-alone reports on intellectual assets)				
Institution / country	Reference	Scope	Year*	Audit related notes or activities
European Union	Intellectual Capital Statements – Made in Europe, European ICS Guideline, DG Research (EC 2008a)	SME	2008	European ICS Guideline - ICS Quality Requirements as certification basis. An audit procedure was developed by Fraunhofer IPK (Mertins, Wang, Will 2007). ICS audits will be carried out in 5 European countries within InCaS project by Fraunhofer Technology Academy.
European Union	RICARDIS report, DG Research (EC 2006)	SME	2006	The report mentioned the importance of ICS audits.
European Union	Guidelines for Managing and Reporting on Intangibles, MERITUM Project (MERITUM 2002)	All companies	2002	There are companies offering certification services for this guideline.
Germany	Intellectual Capital Statements – Made in Germany, Federal Ministry of Economics and Labour (BMWA 2004)	SME	2004	Audit related activities are in progress.
Denmark	Intellectual Capital Statements – The new Guideline, Ministry of Science, Technology and Innovation (DMSTI 2003)	All companies	2003	External verification is an additional opportunity to check the systematic approach of the process and credibility of the external ICS (DMSTI 2003). There are companies offering certification services for this guideline.
* Year of the latest version				

The ICS guidelines, e.g. from Denmark or Germany, are useful for companies to implement an ICS, whereas for audit purposes it is difficult to use them as the certification basis, since the guidelines include an overview

of general ICS information, many explanations, mandatory and non-mandatory activities for the company. The company as the auditee is not aware of which requirements the auditor will examine and how to prepare for the audit. Bearing this in mind, we compiled the ICS quality requirements with only must-have requirements and definitions. Non-compliance to the catalogue will lead to a denial of the certificate. In the next sections, we refer to the document 'European ICS Guideline - ICS Quality Requirements' as the 'requirement catalogue'.

The InCaS project uses an approach based on the German ICS methodology (cf. BMWA 2004; Mertins, Alwert, Heisig 2005) and its guideline describes the structure and basic content of the ICS as well as the general model and the creation procedure of the ICS. Within the creation process, the organisation analyses, assesses and documents three dimensions of IC: human capital, structural capital and relational capital (EC 2008a).

2.1 ICS certification process

For the development of the ICS certification methodology (figure 1) customized to the InCaS / German approach, three common auditing approaches are partially applicable and are considered in detail (Mertins, Wang, Will 2007):

- for quality management systems the 'ISO 19011 - Guidelines for quality and/or environmental management systems auditing' (cf. ISO 2002),
- for EFQM application for European Excellence Award the 'Guidelines for the Excellence Award Applicants' (cf. EFQM 2007),
- for financial auditing the German guideline 'Rechnungslegungs- und Prüfungsgrundsätze für die Abschlussprüfung' (cf. IDW 2006).

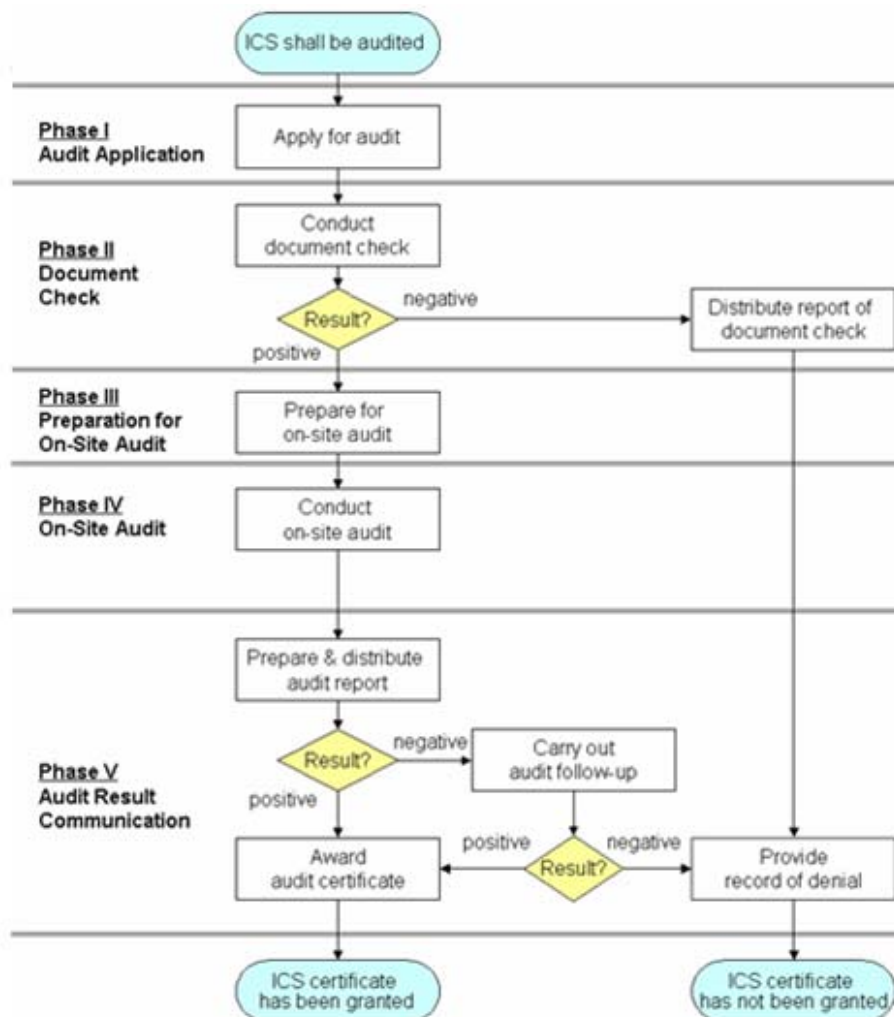


Figure 1: ICS certification process

The recommended time for carrying out an ICS audit is approximately one month after the ICS completion. The duration of the audit depends on the size, complexity and number of locations of the organisation to be audited (auditee). In general, on-site audit should last approximately one day, but the duration increases with the number of locations.

2.2 Five ICS quality criteria

In the last years a number of recognised quality assessment criteria have been developed for financial statements. They are also relevant for the ICS and can be used to increase the coherence and quality of ICS (DATI 2000). More important, these quality criteria shall support the fundamental purposes of ICS. Therefore a verified ICS will be more credible and more effective for IC management. Since we apply audit as the valuation method, the defined quality criteria have to be easily auditable. Considering these preconditions, we classified five basic quality assessment criteria for auditing ICS in accordance to InCaS / German procedure:

- completeness according to the requirement catalogue,
- plausibility,
- verifiability,
- representative for the organisation and
- sustainable regarding the impact on IC management of the organization.

Compared to the nine quality criteria for the financial statement of Danish Agency for Trade and Industry, all nine criteria are included in the defined five ICS quality criteria. Furthermore, we added the criterion 'sustainability' to highlight the importance for ICS in having sustainable impact on IC management. Regarding to the 'Principles for Effective Communication of Intellectual Capital' by European Federation of Financial Analysts Society Commission on Intellectual Capital (EFFAS CIC 2008), figure 2 displays how the ICS quality criteria relate to the ten principles.

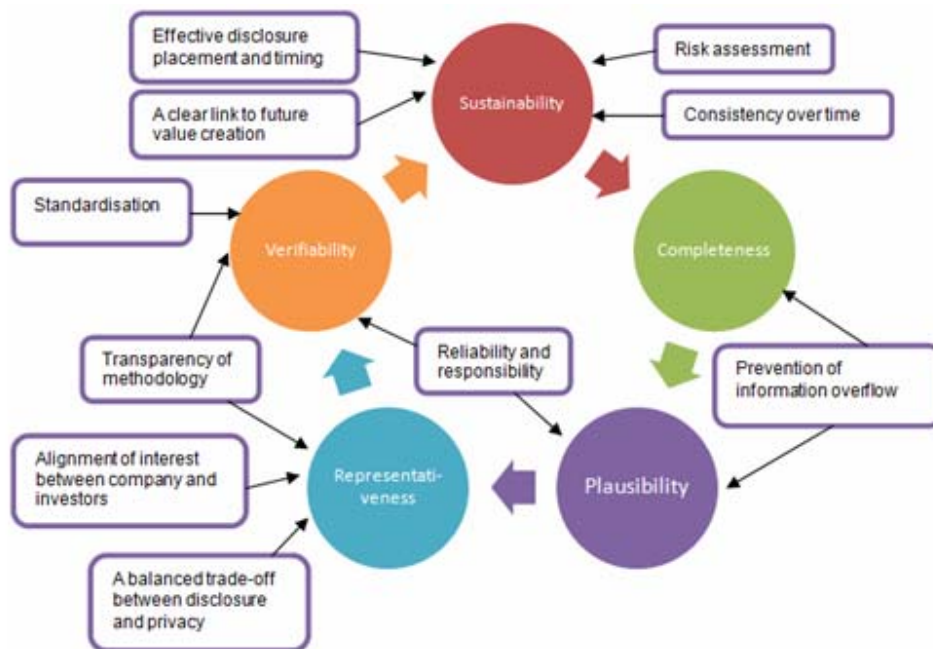


Figure 2: ICS quality criteria and ICS principles of EFFAS CIC

Following the ICS quality criteria, we questioned the ICS implementation process and the ICS content thoroughly in order to reveal the crucial factors for a successful ICS implementation. Specifically, we employed two quality techniques for further analysis, the cause-and-effect diagram and the failure modes and effects analysis (FMEA). The cause-and-effect diagram analyzes potential causes of a defect, error or problem of a process under identification (cf. Pfeifer 2002).

There are a number of standards suitable for performing FMEA (cf. Prefi 2007). For our application we selected the proceeding of EN 60812 (DIN 2006) with significant modification to its FMEA templates. The information about which failure modes are most likely to affect the ICS implementation gave us guidance in defining quality requirements. In addition, it assisted us in defining checking methods and desired audit

evidences within the ICS audit. For the development of the requirement catalogue, the aim was to minimize the requirements for the ICS implementation to allow great latitude for the companies in creating their ICS. We decided only on process requirements when it was impossible to specify adequately the product without doing so (cf. ISO 1994). The catalogue is an essence of the guidelines from the German project (BMW 2004) and from the EU InCaS project (EC 2008a).

2.3 Quality requirements for ICS

The requirement catalogue specifies quality requirements for ICS that can be used for internal application within organizations and/or for certification. It focuses on the quality of the ICS for external reporting, the ICS creation process and the sustainable impact of the ICS (cf. figure 3). We present a selection of the requirements as follows (cf. EC 2008b). The documentation required for ICS audits are: the ICS itself and records providing evidence of conformity to the quality requirements.

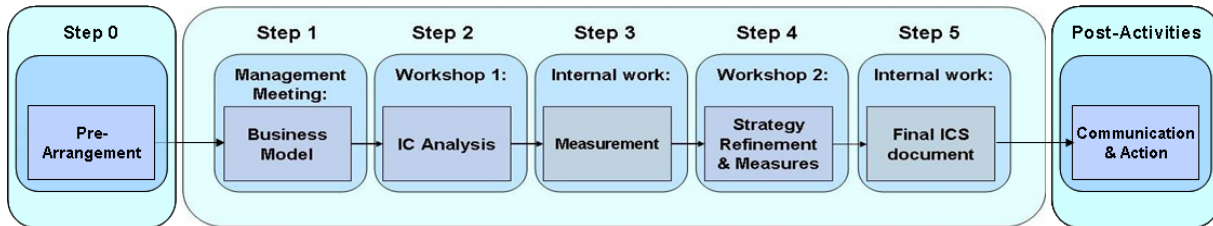


Figure 3: ICS procedure model of InCaS

All participants in the ICS implementation process and their respective roles are documented in every step of the implementation.

2.3.1 Step 0 – Pre-arrangement

In small and medium sized organizations, the project team consists of members from all organizational units and hierarchy levels concerning the main business processes. These members have an overview of the colleagues' perception and speak on their behalf. Furthermore, ICS project leader, moderator and keeper of the minutes are competent on the basis of appropriate education, training, skills and experience.

2.3.2 Step 1 – Business model

Together with the top management, the organization defines the system boundaries and its created value (what is offered to customers), and it identifies the related value adding business processes. Furthermore, the organization defines the main strategic objectives including external business environment and main business success factors. All participants in the ICS implementation process and their respective roles are documented in every step of the implementation process.

2.3.3 Step 2 – IC analysis

The IC analysis shall be carried out in a workshop and will be divided into three major parts: IC factor definition, QQS-Assessment and Weighting (Impact Scoring). The participants determine the most important IC factors (3-5 factors per IC category) and adjust the definitions to the company's specific needs. The definitions of IC factors are representative for the organization and do not conflict with the definitions of the common IC factors (cf. table 3). The participants assess all IC factors regarding quality/quantity and systematic management (QQS). The reasons and evidences for the QQS assessment results are documented. In addition, the reasons and evidences for the impact scoring results are documented. At the workshop, each participant represents a specific organizational unit and speaks on its behalf. Each statement has the same weight regardless of the position of the person. The participants score the impacts of all IC factors relating to their impact on business success. The simplified version of Impact Analysis is sufficient and reasons and evidences for the Impact Analysis results are documented. If there are significant differences between the participants, the reasons shall be assessed and documented.

2.3.4 Step 3 – Measurement

The organization determines IC indicators for at least 50 per cent of the most important IC factors according to the impact analysis. The reasons for the IC indicator selection are documented. The determined IC indicators have definitions which are consistent with the definitions of standard IC indicators and cover the basic indicators stated in the requirement catalogue (cf. table 2). The IC factors are:

- useful concerning the business model, strategy and their specific measures for IC development,
- appropriate to measure particular IC factors and verifiable.

Table 2: List of standard IC Indicators – excerpt

Human Capital			
IC Factor	Name of Indicator	Unit	Definition and Calculation
Professional Competence	Employees with university degree	Number	Number of employees with university degree the SME had in the last accounting year
	Days used for further qualification	Number	Total number of days used for further qualification (e.g. additional university courses, off-the-job training) in the last accounting year

2.3.5 Step 4 – Strategy refinement & measures

The participants interpret the results of the IC analysis in a way which represents the perception of the employees. The result interpretations (causes for strengths and weaknesses) are documented.

If there are major differences between the workshop participants, the reasons shall be assessed and documented. The evaluation of the status quo concerning strengths and weaknesses

- is plausible and verifiable
- is representative for the organization
- includes areas of strengths and weaknesses

The participants adjust the IC strategy based on the results and analyse the major potentials for improvement and related measures plausibly. The organization derives major potentials for improvement and at least 3 numbers of measures (1 for each term).

- Short term: due date less than 3 months
- Medium term: due date less than 1 year and
- Long term: due date longer than 1 year

The planning of measures includes objective of the measure, responsibility, due date and value of IC indicators to be achieved.

2.3.6 Step 5 – Final ICS document

The results of the ICS implementation are presented in the final ICS document following the given structure. The information stated in the ICS is:

- relevant, actual,
- in reasonable detail,
- presented in a clear way and
- plausible and representative

The top management affirms the representative character of the ICS by signing it.

2.3.7 Post activities

The organization communicates and explains the ICS content internally so that it is understood by the employees. Defined short and midterm measures are planned or/and in realisation. Defined measures are to be implemented within deadline. The development of the IC indicators relevant for the measures is monitored in a reasonable interval. The organization assesses the effectiveness of implemented measures. In case of irregularity, further suitable measures shall follow.

2.4 Conclusions on ICS quality assurance

The certification of ICS in compliance with the requirement catalogue has the following objectives as benefits for the companies:

- The company undergoes a quality check by a neutral external ICS auditor assuring that the ICS is of high-quality level, in other words, the assessment outcomes and the measures are 'right' and based on verifiable sources.
- The company receives further improvement suggestions after a detailed on-site audit by an expert who knows the IC performance of other companies.
- A certified ICS is not solely a self-assessment result and has a higher credibility for external stakeholders such as investor, creditor and customer.

Furthermore, if ICS fulfils several requirements in structure, content and length (cf. Wuscher, Will, Alwert, Bornemann 2006), it contributes to a more homogeneous rating of SMEs than analysts' assessment based solely on information from annual financial reporting. Therefore, it reduces risks for both banks and SMEs (cf. Alwert, Bornemann, Will 2007).

According to Herrmann, an audit is a special form of an examination at which an auditor can determine to what extent the audited object meets the requirements. The audited object can be a product, a process or a system. The basic prerequisite is: the auditors must not be organizationally attached to the audited organisation and have to be independent. In this case, the audit is a well-proved and effective management instrument (cf. Herrmann 2007). However, following the experiences of auditing for quality management systems, Lobinger indicates the difficulties of auditing. The auditor is supposed to both examine and identify improvement potentials by the employees' collaboration. The employees often only see the examination character and are afraid of talking about weaknesses to avoid risking a non-conformance (cf. Lobinger 2002). During the ICS audits, the employees should not feel intimidated. The objective of an ICS is to find out the real status quo of the IC of the organisation for an effective IC management. The employees are supposed to be honest and to tell their perceptions. In the worst case the ICS audit comes to the conclusion that the written ICS does not reflect the company's IC performance giving the company the opportunity to correct the ICS with the help of the audit report. Therefore, prior to the audit the executives shall broadly communicate the purpose and character of the audit. In case of a denial of the ICS certificate even after correction, the company can redo the ICS and apply for the next audit. The earliest date is one month after completion since the new defined short-term measures shall be implemented at the audit.

3. Study on sectoral differences of IC

In recent years different national approaches on the management of IC have been developed and tested, but there is no European-wide standard regarding the measurement and management of IC so far. The emerging need for a consistent – non-monetary - method was the starting-point for the German and European project. Keeping the context-sensitive nature of knowledge in mind these projects aimed to develop a method to support companies in managing their IC. Whereas former papers presented the projects' practical benefits for SMEs (Will, Wuscher, Bodderas 2006) and described the method in detail (Mertins, Alwert, Will 2006; Mertins, Will 2007) this study intends to analyse the results in terms of how far companies differ regarding the perceived importance of IC factors. In order to accomplish this goal the participating companies have been categorised by sectors and the existing company specific results regarding the evaluation of their IC have been analysed on an aggregated level.

The actual data collection process within the two pilot-projects has been standardised by obliging the companies to follow the same method and to use a tool-box for data collection which provides templates and automated visualisations of the ICS results in the respective company and allowed later aggregations.

3.1 Basis

Based on the results of phase I of the German pilot project, fifteen IC factors have been delineated. This set of harmonised IC factors has been used and continuously reviewed during later stages of the German project and in the course of the European project. The set covers about 80-90 per cent of the factors SMEs mention as relevant for business success (Mertins, Will, Wuscher 2007) which is sufficient considering the highly context-sensitive nature of IC.

Table 3: Harmonised IC factors

Type of IC	IC Factor	Definition
Human Capital	Professional Competence	The expertise gained within the organisation or in the employee's career: professional training, higher education, training courses and seminars, as well as practical work experiences gained on-the-job.
	Social Competence	The ability to get on well with people, communicate and discuss in a constructive manner, nurturing trust-enhancing behaviour in order to enable a comfortable co-operation. Furthermore the learning ability, the self-conscious handling of critique and risks as well as the creativity and flexibility of individual employees.
	Employee Motivation	The motivation to play a part within the organisation, to take on responsibility, committed to the fulfilment of tasks and the willingness for an open knowledge exchange. Typical sub areas are for example satisfaction with the labour situation, identification with the organisation, sense and participation of achievement.
	Leadership Ability	The ability to administrate and motivate people and to develop and communicate strategies and visions and their empathic implementation. Negotiation skills, assertiveness, consequence and credibility as well as the ability to create a scope of self dependant development belong to this IC factor.
Structural Capital	Internal Co-operation and Knowledge Transfer	The manner how employees, organisational units and different hierarchy levels exchange information and co-operate together (e.g. conjoint projects). The focused knowledge transfer among employees and between generations.
	Management Instruments	Tools and instruments supporting the efforts of leadership and therefore have an impact on the way how decisions are made and what information paths are incorporated in the decision-making process.
	IT and Explicit Knowledge	The computer assisted working environment including all elements of explicit knowledge. Among these are for example specific technical operating principles, networks, fileserver, intra- and extranet, databases, internet and software applications including the content.
	Product Innovation	Innovations of great importance for the future of the organisation. Characterised by the fact, that they will bring new products into being or fundamentally change existing products and eventually result in a patent application
	Process Optimisation and Innovation	Optimisation and improvement of internal procedures and processes, e.g. continuous improvement of all business processes as well as idea management in order to gather suggestions of improvement
	Corporate Culture	The corporate culture comprises all values and norms, influencing joint interaction, knowledge transfer and the working manner. Compliance to rules, good manners, 'Do's and Don'ts' and the handling of failures are important aspects of this factor.
Relational Capital	Customer Relationships	Relationships to former, current and potential customers. The management of these relations comprises activities like sales and marketing, CRM and face-to-face customer cultivation by employees.
	Supplier Relationships	Relationships to former, current and potential suppliers. The management of these relations comprises activities concerning purchases and the cultivation of suppliers.
	Public Relationships	Relationships to the public. Including the relationships to former and potential employees and the public in general, all activities of public relationship management as well as corporate citizenship, e.g. supporting regional activities.
	Investor Relationships	All relations to investors - external and internal investors - i.e. banks, owners, stockholders. The management of these relations comprises all activities providing specific information to the faction, e.g. accountability.
	Relationships to Co-operation Partners	All relations to professional associations, bodies, and societies. The management of these relationships comprises activities like joint acquisition of customers, suppliers, investors as well as an active knowledge transfer on R&D partnerships, best-practice transfer and networking activities.

Within each project the data was collected by applying basically the same method. But as the German and the European project's method and categorisation slightly differ, the results were examined separately. Within the German project 42 valid data sets could be collected, and 25 within the InCaS project. The results allow drawing quantitative and qualitative conclusions about the strategic relevance of particular IC factors and how this relevance differs depending on the main business sector.

3.2 Analysis results

Table 4 summarises the major differences between the sectors Industry and Services within the German pilot-project, showing the three most important IC factors for achieving strategic business success:

Table 4: Strategically most important IC factors (German pilot project)

Sector \ Rank	1.	2.	3.
Industry	Professional Competence (HC)	Employee Motivation (HC)	Internal Co-operation and Knowledge Transfer (SC)
Services	Employee Motivation (HC)	Professional Competence (HC)	Leadership Ability (HC)

As already illustrated it has become obvious that Human Capital plays the major role within the analysed SMEs' business activity overall. Nevertheless, whereas all three most important factors in the surveyed service companies are HC factors, there is one SC factor among the three most important factors in Industry, giving a hint to the higher importance of (formal) structures in this sector.

This observation may be verified by the differences in the HC factor Leadership Ability and the SC factor Management Instruments. Possibly, Leadership Ability is perceived within Services as highly important as this business activity requires reacting to new situations which do not allow complete standardisation of processes. It requires highly skilled management personnel in order to manage these unexpected situations adequately. Supporting instruments for this explicit management process may help the responsible management staff.

The greater formalisation and standardisation of value-adding processes in the Industry sector may result in the lower impact of single managers and leaders. Accordingly, the predominance of Professional Competence within Industry could be caused by the highly specialised tasks and processes within this sector which require specific expert knowledge.

In contrast to this, service companies seem to rely on motivated employees even more than on their expertise, as the order of the HC factors in this sector shows.

Trying to derive strategic recommendations for knowledge management activities in those two main sectors, it has to be emphasised that these results are not yet statistically representative. Nevertheless, some basic learnings may be retained: Depending on the formalisation and standardisation of the business model and the business processes, the Industry sector should focus on elaborating knowledge management activities based on formal structures and explicit knowledge (codification strategy). Service companies, on the other hand, really have to focus on the recruitment and development of their individual employees if they want to ensure long-term and strategic business success (personalisation strategy). What seems to be true internally can consistently be observed externally, i.e. in the Relational Capital factors: Whereas it seems to be strategically crucial to build up partner networks in the Services sector, the Industry sector still relies much more on Supplier Relationships, optimising the supply chain as a linear input-output process.

Table 5: Strategically most important IC factors (European pilot-project InCaS)

Sector \ Rank	1.	2.	3.
Business Services & IT	Customer Relationships (RC)	Professional Competence (HC)	Employee Motivation (HC)
Machinery & Equipment	Customer Relationships (RC)	Professional Competence (HC)	Product Innovation (SC)
Construction	Leadership Ability (HC)	Process Optimisation and Innovation (SC)	Professional Competence (HC)
Electronics	Employee Motivation (HC)	Professional Competence (HC)	Co-operation & Knowledge Transfer (SC)
Retail trade & other services	Employee Motivation (HC)	Customer Relationships (RC)	Corporate Culture (SC)

Table 5 summarises the ranking of IC factors regarding their perceived importance within each sector within the European project InCaS. First of all it is remarkable that similarities across the typical differentiation of

sectors between Industry and Services occur. Business Services & IT – belonging to Services – and Machinery & Equipment – belonging to Industry – both perceive Customer Relationships as most important and Professional Competence as second most important for business success. This could possibly indicate that the traditional distinction between Industry and Services is improper for researching the strategic impact of IC. Rather companies should be classified by comparing the actual business models. In this case Business Services & IT and Machinery & Equipment show similar IC configuration possibly because they having similar business models. Both sectors have to deal with often very specified and varying customer needs – that explains the importance of Customer Relationships – and have to apply state-of-the-art technological expertise – which explains the importance of Professional Competence.

3.3 Conclusion of study on sectoral differences of IC

The objective of the Study on Sectoral Differences of IC is to find out, if there are any significant differences between sectors regarding the perceived importance of IC factors and delineate some basic strategic recommendations. The German SMEs have been grouped according the major sectors Industry and Services which resulted in n=15 for Industry and n=27 for Services. The group ‘Industry’ includes branches such as producers of machinery and equipment, electronics, tools, steel, etc. The ‘Service’ sectors represents branches such as business services and IT services, multimedia services, medical care, consumer services etc. Table 2 shows the totals by group (Industry vs. Service) and variable (IC factor).

Figure 4 shows the IC factors’ Strategic Importance Index for the two sectors Industry and Services, combining the frequency (how many companies named the factor?) and the relative influence (how strong does the factor affect the company’s strategic objectives?) of each IC factor.

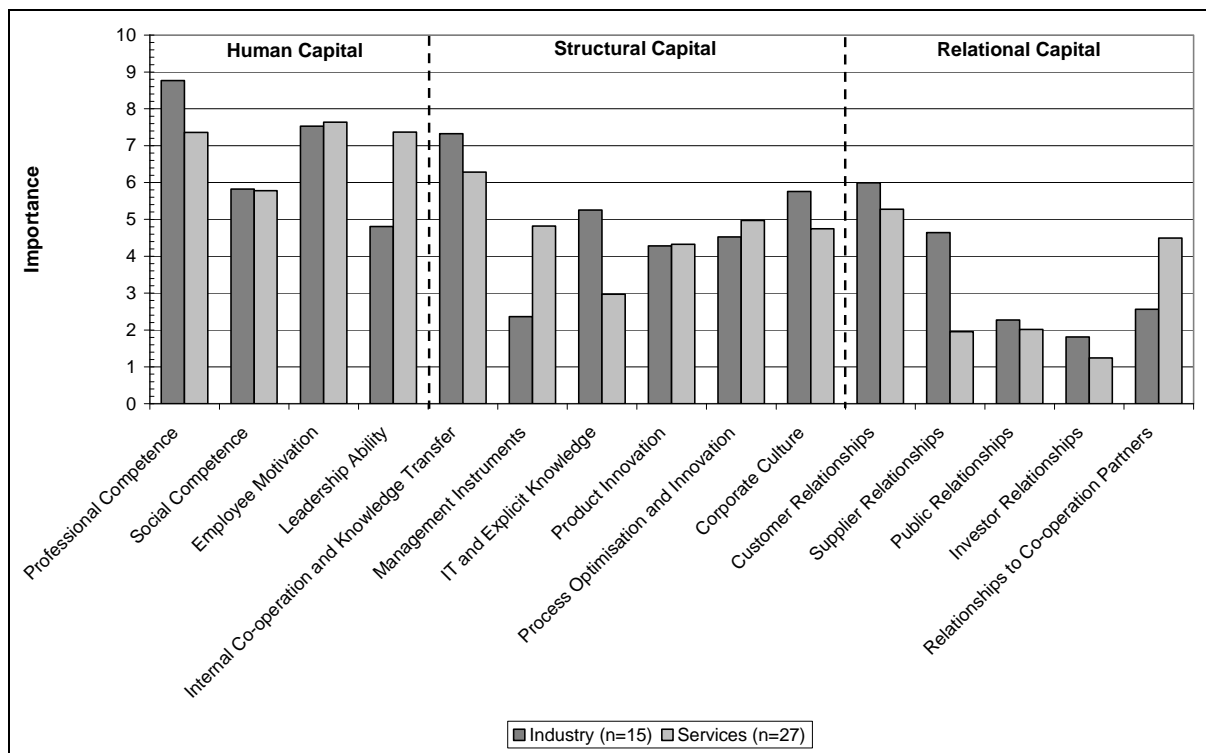


Figure 4: Strategic importance of IC factors within the sectors Industry and Services

Comparing the two sectors the differing importance of two Human Capital factors is remarkable. Whereas Professional Competence (comprising formal qualification as well as experiences gained in practice) plays the major role for Industry, it is Employee Motivation which has been perceived as the most important IC factor for Services. Another Human Capital factor – Leadership Ability – has been perceived by Services as considerably more important regarding business success than by SMEs belonging to Industry.

Major differences between the sectors occurred regarding Structural Capital factors, too. Whereas IT and Explicit Knowledge (summarising all electronic information and data bases) has a much higher impact on the strategic business success in Industry, the difference for Internal Co-operation and Knowledge Transfer (including all structures for face-to-face knowledge sharing, e.g. in project teams, communities of practice etc.) is still visible, but less significant. On the contrary, Management Instruments (e.g. management by

objectives, reporting structures, controlling systems etc.) are perceived as having a much higher impact on business success in Services than in Industry. Whereas there seems to be no difference in Product Innovation based on the combined index shown here, more service companies have named the factor, but its relative influence on business success is higher in Industry (those differences are balanced out in the combined index).

The two major differences in the Relational Capital lie in Supplier Relationships (higher strategic relevance in Industry) and Relationships to Co-operation Partners (higher strategic relevance in Services).

4. Outlook

Further standardisation is necessary to fulfil several needs. One area of application is the communication of a SMEs IC to stakeholders in for example, the financial market. Field reports and surveys have shown that complementing financial data with information on intangible resources can sharpen the view on SMEs' creditworthiness and valuation (Botosan, Plumlee 2000; Thomas 2003; Will, Alwert, Bornemann, Wuscher 2007). If some requirements about structure, content and length of an IC report are fulfilled (Wuscher, Will, Alwert, Bornemann 2006), it contributes to a more homogeneous rating of SMEs, than analysts' assessment based solely on information from annual financial reporting. Therefore it reduces risks for both banks and SMEs (Alwert, Bornemann, Will 2007).

Including quality assurance activities early in the implementation is an efficient way to enhance the quality of the outcome. For this reason, we recommend companies use the requirement catalogue internally for preparation and quality checks during the ICS creation. The effects of the ICS certification in the long run stimulate the proper application of the European ICS guidelines and encourage sustainable usage of ICS as an internal management tool by checking the progress of realisation measures. They ensure the reliability of ICS so that for example creditors will consider this information as an important input for their rating decisions, thus establishing the reputation of ICS as a trustworthy document and consolidating the ICS as a valuable management tool. Greater acceptance by stakeholders will trigger the further use of this method.

This paper presented the results of a study on sectoral differences of IC using the data from the German and European pilot-project, but it has to be stated that the sample size was too small to allow drawing representative conclusions. Having achieved the desired level of harmonisation and quality standards within the project InCaS (Mertins, Wang, Will 2007), the future challenge is to trigger the development of an IC benchmarking concept in order to make ICSs more comparable between organisations which will generate an additional benefit for practical application and for researching IC within organisations. This IC benchmarking concept based on minimal reporting requirements would ensure quality and comparability of ICS as a management and reporting instrument as well as an instrument for scientific data collection and analysis. In order to go deeper in the process of understanding the problems of SMEs it could be helpful to analyse this set of data according to other groupings, such as the company's maturity level or lifecycle stage or the company's type of strategy. According to other studies (Pawlowsky et al. 2006) the way companies handle knowledge and the focus of IC management depends on their type of strategy. This could also be a suitable approach for the IC benchmarking concept with relevant practical implications: bringing together companies that are based on the same type of strategy and show a similar configuration of IC factors in order to share best practices and work on solutions for common IC challenges together.

References

- Alwert, K.; Bornemann, M.; Kivikas, M. (2004) 'Intellectual Capital Statement – Made in Germany. Guideline' Published by the Federal Ministry for Economics and Technology, Berlin, [online], <http://www.bmwi.de/BMWi/Redaktion/PDF/W/wissensbilanz-made-in-germany-leitfaden,property=pdf,bereich=bmwi,sprache=de,rwb=true.pdf>
- Alwert, K.; Bornemann, M.; Will, M. (2007) 'Does Intellectual Capital Reporting Matter to Financial Analysts?', Paper read at the 8th European Conference on Knowledge Management, Barcelona, Spain
- BMWA (Federal Ministry of Economics and Labour) (eds) (2004) 'Intellectual Capital Statement – Made in Germany. Guideline', [online], Berlin, <http://www.bmwi.de/Navigation/Technologie-und-Energie/Informations-gesellschaft/tagung-wissensbilanz.did=41128.html>
- Botosan, C. A.; Plumlee, M. A. (2000) 'Disclosure Level and Expected Cost of Equity Capital: An Examination of Analysts' Rankings of Corporate Disclosure and Alternative Methods of Estimating Expected Cost of Equity Capital', [online] http://papers.ssrn.com/sol3/papers.cfm?abstract_id=224385#PaperDownload
- DATI (Danish Agency for Trade and Industry) (2000) *A Guideline for Intellectual Capital Statements: A Key to Knowledge Management*, Copenhagen

- DIN (2006) DIN EN 60812:2006 - Analysis techniques for system reliability – Procedure for failure mode and effects analysis (FMEA), Beuth, Berlin
- DMSTI (Danish Ministry of Science, Technology and Innovation) (2003) 'Intellectual Capital Statements – The new Guideline', [online], Copenhagen, http://videnskabsministeriet.dk/site/forside/publikationer/2003/intellectual-capital-statements---the-new-guideline/guideline_uk.pdf
- EC (European Commission) (2003) THE PRISM REPORT 2003, Report Series No. 2, October 2003, [online] http://www.euintangibles.net/research_results/FinalReport.pdf
- EC (European Commission) (2006) Reporting Intellectual Capital to Augment Research, Development and Innovation in SMEs (RICARDIS), [online] http://ec.europa.eu/invest-in-research/pdf/download_en/2006-2977_web1.pdf
- EC (European Commission) (2008a) 'InCaS: Intellectual Capital Statement – Made in Europe, European Intellectual Capital Statement Guideline' developed by the InCaS Consortium
- EC (European Commission) (2008b) 'Intellectual Capital Statement Quality Requirements', developed by the Fraunhofer Institute for Production Systems and Design Technology (IPK), Berlin
- EFFAS CIC (European Federation of Financial Analysts Society Commission on Intellectual Capital) (2008). Principles for Effective Communication of Intellectual Capital. [online] www.effas.com/pdf/EFFAS_CIC_web.pdf
- EFQM (2007) 'Guidelines for the Excellence Award Applicants'
- Herrmann, J. (2007) 'Audit', in: Pfeifer, T.; Schmitt, R., Masing, W. (eds) *Masing Handbuch Qualitätsmanagement*, 5th edition, Hanser, Munich, pp 331-341
- IDW PS 201 (2006) Rechnungslegungs- und Prüfungsgrundsätze für die Abschlussprüfung, in: WPg 2006, pp. 850 ff., No. 13/2006, 18.05.2006
- ISO (1994) ISO/IEC Guide 7: Guidelines for drafting of standards suitable for use for conformity assessment, Beuth, Berlin
- ISO (2002), ISO 19011:2002 Guidelines for quality and/or environmental management systems auditing, Beuth, Berlin
- Lobinger, W. (2002) 'Auditprozess im Wandel: Die neuen Managementsysteme erfordern neue Ansätze im Auditwesen', in: *Qualität und Zuverlässigkeit*, Vol 47, No. 8, pp. 780-781
- MERITUM (2002) Guidelines for Managing and Reporting on Intangibles (Intellectual Capital Report), Vodafone Foundation, Madrid, [online] <http://www.uam.es/proyectosinv/meritum/Link%20Guidelines%20Meritum/version%20inglesa%20completa.pdf>
- Mertins, K., Alwert, K., Heisig, P. (eds.) (2005) *Wissensbilanzen – Intellektuelles Kapital erfolgreich nutzen und entwickeln*, Springer, Berlin
- Mertins, K.; Alwert, K.; Will, M. (2006) 'Measuring Intellectual Capital in European SME', Proceedings of I-KNOW '06, 6th International Conference on Knowledge Management, published by Tochtermann, K.; Maurer, H., Graz, Austria, pp 21-25
- Mertins, K.; Wang, W.-H.; Will, M. (2007) 'How to ensure the quality and credibility of Intellectual Capital Statements', Paper read at the 8th European Conference on Knowledge Management, Barcelona, Spain
- Mertins, K.; Will, M. (2007) 'A consistent assessment of Intellectual Capital in SMEs', Paper read at the 8th European Conference on Knowledge Management, Barcelona, Spain.
- Mertins, K.; Will, M.; Wuscher, S. (2007) 'Erfolgsfaktoren des Intellektuellen Kapitals in mittelständischen Unternehmen', Paper read at the KnowTech 2007, Frankfurt am Main, Germany, November.
- OECD (2006) 'Intellectual assets and value creation: implications for corporate reporting', Paris
- Pawlowsky, P.; Gerlach, L.; Hauptmann, S.; Puggel, A. (2006) *Wissen als Wettbewerbsvorteil in kleinen und mittelständischen Unternehmen. Fokus*, TU Chemnitz.
- Pfeifer, T. (2002) *Quality Management – Strategies, Methods, Techniques*, Hanser, Munich
- Prefi, T. (2007) 'Qualitätsmanagement in der Produktentwicklung', in: Pfeifer, T.; Schmitt, R., Masing, W. (eds) *Masing Handbuch Qualitätsmanagement*, 5. edition, Hanser, Munich, pp 405-433
- Thomas, Alison (2003) A Tale of Two Reports, in *European Business Forum*, Issue 16, No. 4, pp. 79-81. Retrieved November, 2006, [online], http://www.ebr360.org/downloads/ebf_issue16.pdf
- Will, M.; Alwert, K.; Bornemann, M.; Wuscher, S. (2007): 'Wissensbilanz – Made in Germany – Auswirkungen eines Berichts über Intellektuelles Kapital auf die Unternehmensbewertung', Recent study by Fraunhofer IPK, Berlin. [online] http://www.akwissensbilanz.org/Projekte/070201_Finanzmarkt_Wirkungstest_Teil2_V17.pdf
- Will, M.; Wuscher, S.; Bodderas, M. (2006): 'Wissensbilanz – Made in Germany – Nutzung und Bewertung der Wissensbilanz durch die Pilotunternehmen', Recent study by Fraunhofer IPK, Berlin. [online] http://www.akwissensbilanz.org/Projekte/KMU_Wirkungstest_Teil2.pdf
- Wuscher, S.; Will, M.; Alwert, K.; Bornemann, M. (2006): 'Wissensbilanz – Made in Germany - Projektstudie über weiche Faktoren als Teil der Unternehmenseinschätzung durch Kapitalgeber', Recent study by Fraunhofer IPK, Berlin. [online] http://www.akwissensbilanz.org/Infoservice/Infomaterial/061214_Finanzmarkt_Wirkungstest_Teil1_V16.pdf