Journal of Intellectual Capital

Is the literature on content analysis of intellectual capital reporting heading towards a dead end?

Viktoria Goebel

Is the literature on content analysis of intellectual capital reporting heading towards a dead end?

Viktoria Goebel
Business School, University of Edinburgh, Edinburgh, UK

Abstract

Purpose – The purpose of this paper is to respond to the call by Dumay and Cai (2014) for new ideas to enhance intellectual capital (IC) research. One possibility is to draw conclusions on comparability across the results of prior studies. This study investigates whether the results of prior IC content analyses are comparable despite differences in their IC research frameworks.

Design/methodology/approach – A content analysis of 428 German management reports is conducted, capturing the IC reporting scores for individual IC items to investigate the role of certain widely used IC items. The relationships of IC scores for different combinations of widely used IC items are further examined in a correlation analysis to indicate comparability of prior results.

Findings – The findings show that widely used IC items capture the majority of IC reporting and that the IC scores for different combinations of these IC items are highly correlated. These findings indicate that the results of prior IC content analyses are comparable as long as most of the widely used IC items are included in prior IC research frameworks.

Research limitations/implications – The study contributes to IC reporting research as it shows that conclusions can be drawn across prior studies in meta-analyses because the results of prior studies are comparable in rankings and key findings.

Originality/value – Although content analyses of IC reporting have been previously criticised, this study seminally questions the comparability of the results of prior studies due to differences in the IC research frameworks.

Keywords Disclosure, Intellectual capital, Narratives, Content analysis, Research framework

Paper type Research paper

1. Introduction

The aim of this study is to investigate whether the results of prior content analysis studies on intellectual capital (IC) reporting are comparable despite differences in their IC research frameworks. The findings have implications for the research area of IC content analyses, because prior studies can only validly be consulted for meta-analyses provided that their results are comparable in rankings and key findings. Assurance on comparability would enhance conclusions in the research area of IC content analyses. Dumay and Cai (2014) critically review content analyses of IC reporting and criticise the plethora of individual studies following similar approaches in IC content analysis. They ask for an example of how IC content analysis can be taken forward. One possibility to utilise the remarkable amount of prior IC content analyses is to draw conclusions across the results of prior studies in meta-analyses. However, prior researchers have

Helpful comments on earlier drafts of this paper by Professor Pauline Weetman and Professor Bill Rees are gratefully acknowledged. The author would also like to thank the participants of the EAA Annual Congress 2013 for their useful feedback.

Journal of Intellectual Capital
Vol. 16 No. 3, 2015
pp. 681-699

1469-1930
DOI 10.1108/JIC-04-2014-0048

adapted their IC research frameworks according to different research settings under review. Hence, an investigation of the comparability of prior IC reporting results is necessary before meaningful meta-analyses can be conducted.

Initial studies tried to describe the phenomenon of intangible resources (e.g. Brooking, 1996; Edvinsson and Malone, 1997; Roos *et al.*, 1997; Stewart, 1997; Sveiby, 1997). They established the idea of IC and highlighted its strategic importance. IC is seen as the basis of a company's ability to react efficiently to the environmental context by utilising its intangible resources (Brooking, 1996; Hall, 1992; Stewart, 1997). Following this view, IC is difficult to define as it is dynamic and constantly developing. In order to approach IC reporting in content analyses, researchers have used coding devices with pre-defined lists of IC items. Hence, prior studies defined IC in their research frameworks according to their understandings of IC. As prior studies have investigated IC reporting in different research settings, IC research frameworks have been adapted across prior studies to account for differences in the research settings. The question arises whether differences in IC research frameworks cause non-comparability of results across the content analyses, as different aspects of IC may be considered. To investigate this comparability issue of results across IC content analyses, this study focuses on the IC research frameworks in prior studies.

To achieve the research aim, this study compares the resulting IC reporting scores for different sets of IC items. A content analysis is conducted for IC reporting in 428 German management reports, based on a synopsis of prior IC research frameworks adapted to the German setting. Germany offers a unique research setting for investigating comparability as all German listed companies are required to publish a management report with additional information referring to IC (GASC, 2010). For this content analysis, the IC reporting scores for individual IC items are captured separately and are compared to all IC scores. The synopsis of prior IC research frameworks shows a focus on widely used IC items. These items, which are widely used in IC research, account for a high proportion of IC scores in corporate IC reporting. The scores for individual IC items are further analysed in a correlation analysis to investigate the comparability of the results of prior IC content analyses. The findings show that the results of prior IC content analyses are comparable in rankings and key findings, provided that the widely used IC items are included in prior IC research frameworks.

This study is structured as follows. In Section 2, the literature on IC is reviewed focusing on IC definitions and the IC research frameworks applied in prior studies using content analysis. A synopsis of IC research frameworks shows which IC items are considered across prior IC research frameworks, concentrating on widely used IC items. Section 3 outlines the research design for the content analysis, the investigation of widely used IC items and the correlation analysis. In Section 4, the results are discussed regarding the role of widely used IC items and the comparability of the results from prior IC research frameworks. Finally, Section 5 interprets the findings in the light of the question whether differences in prior IC research frameworks have caused the literature on IC content analyses to head towards a dead end.

2. Literature review

2.1 Defining IC

Due to the dynamic nature of IC, a comprehensive definition of IC is not possible but different approaches exist. Some definitions describe what IC does rather than what it is, saying that IC supports value creation as a competitive advantage (e.g. Hall, 1992;

Brooking, 1996; Stewart, 1997). Another approach is to define IC by categories, being outlined as efficient internal structures, beneficial relations and employee skills (Edvinsson and Malone, 1997; Sveiby, 1997). Internal structures support the company in running as a going concern and help create innovation. Beneficial relations to important stakeholders, such as suppliers, customers, business partners and investors represent another cornerstone of IC. Moreover, IC includes people working for the company and their development, such as competencies, qualifications, training and skills. The IC categories are commonly referred to as structural, relational and human capital (Beattie and Thomson, 2007; Li *et al.*, 2008) or internal, external and human capital (Bozzolan *et al.*, 2003; Guthrie and Petty, 2000). Additionally, IC is defined by distinguishing IC from other assets. Roos *et al.* (1997) suggest outer boundaries of IC by contrasting IC to financial capital, consisting of tangible assets in physical or monetary form. IC, on the other hand, comprises the remaining intangible resources. This study follows the definition by IC categories.

2.2 Approaching IC reporting in content analyses

Content analysis has been identified to be a popular research method for investigating IC reporting, despite its acknowledged inherent drawbacks such as subjectivity (e.g. Guthrie *et al.*, 2004, 2012; Beattie and Thomson, 2007; Lee and Guthrie, 2010). The elusive nature of IC creates a difficult situation for content analyses of IC reporting. The broad definitions of IC, according to its effect, its categories or its boundaries with tangible assets, serve as bases for IC reporting research. However, to approach IC with such broad definitions, IC reporting research requires more details. To code for IC more specifically, researchers have introduced IC research frameworks in content analysis studies with checklists of IC-related items (e.g. Guthrie and Petty, 2000; Bontis, 2003; Bukh *et al.*, 2005). These checklists are designed or chosen *ex ante* by the researchers (e.g. Brennan, 2001; Striukova *et al.*, 2008). The IC research frameworks as coding devices can be seen to represent the researchers' understanding of how to define IC for their study. This approach of creating IC research frameworks allows adjustments for IC reporting in different settings to account for potential country differences. In a study of IC reporting in Australian companies, Guthrie and Petty (2000, p. 245) state that their IC research framework is adjusted for "items likely to be reported by Australian companies". Unfortunately, their selection is not explained in detail so that reproductions with country-specific amendments cannot be based on similar procedures.

2.3 Influences between and across IC research frameworks

Re-using previously developed IC research frameworks has become common practice in IC research, as also found by Guthrie *et al.* (2012). They interpret this development as the maturing process of research into IC reporting. According to their argument, new IC research frameworks have been designed for different research projects in the initial stages of research into IC reporting. Later studies increasingly applied or considered prior IC research frameworks for their content analyses. However, Guthrie *et al.* (2012) did not distinguish between adopting and adjusting such IC research frameworks. Consequently, this study argues that although the number of re-used IC research frameworks has increased compared to the number of newly proposed IC research frameworks, it is difficult to conclude whether currently used IC research frameworks show a higher degree of uniformity. Hence, the interpretation by Guthrie *et al.* (2012) of a maturing process may be criticised.

For this study, the IC research frameworks of 22 prior studies are investigated. From the descriptions of the sources of the IC research frameworks in prior studies, these IC research frameworks are often explained as being based on previously published analyses. Comparing these 22 IC research frameworks regarding the IC categories applied and their source, as shown in Table I, two main aspects become apparent. First, a tendency towards a common terminology of IC categories is obvious among later papers. The predominantly adapted categories by more recent studies are named structural, relational and human capital (e.g. Campbell and Rahman, 2010; Hidalgo *et al.*, 2011; Mangena *et al.*, 2010), rather than employee competencies, internal or external capital (Brennan, 2001; Guthrie and Petty, 2000). As the terms structural, relational and human capital have been established as a common terminology, these terms are used in this study as IC categories.

Second, three of these 22 studies can be tracked as the basis for the IC research frameworks of the 19 other studies. The three leading influential studies, namely, Guthrie and Petty (2000), Bontis (2003) and Bukh *et al.* (2005), are quoted frequently as the basis for

IC categories	Studies	Basic studies for IC research framework
Intellectual capital	Bontis (2003)	
	Vergauwen and van Alem (2005)	Bontis (2003)
Internal, external, human	Guthrie and Petty (2000)	
	Bozzolan *et al.* (2003)	Guthrie and Petty (2000)
	Vandemaele *et al.* (2005)	Guthrie and Petty (2000)
	Abeysekera and Guthrie (2005)	Guthrie and Petty (2000)
	Guthrie *et al.* (2007)	Guthrie and Petty (2000)
	Cerbioni and Parbonetti (2007)	Guthrie and Petty (2000)
	Striukova *et al.* (2008)	Guthrie and Petty (2000)
	Lee and Guthrie (2010)	Guthrie and Petty (2000)
Internal, external, employee competencies	Brennan (2001)	Guthrie and Petty (2000)
Structural, relational, human	Vergauwen *et al.* (2007)	Guthrie and Petty (2000), Bontis (2003)
	Beattie and Thomson (2007)	Guthrie and Petty (2000), Bontis (2003)
	Li *et al.* (2008)	Guthrie and Petty (2000), Bontis (2003), Bukh *et al.* (2005)
	Campbell and Rahman (2010)	Guthrie and Petty (2000)
	Mangena *et al.* (2010)	Guthrie and Petty (2000)
	Li *et al.* (2012)	Guthrie and Petty (2000), Bontis (2003)
General IC, structural, relational, human	Brüggen *et al.* (2009)	Bontis (2003)
Human, customers, organisation, strategy, innovation/R&D	García-Meca and Martinez (2007)	Bukh *et al.* (2005)
Employees, customers, processes, technologies, strategy, R&D	Bukh *et al.* (2005)	
	García-Meca *et al.* (2005)	Bukh *et al.* (2005)
	Singh and Van der Zahn (2008)	Bukh *et al.* (2005)

Notes: This table shows a comparison of IC categories applied in previous IC research frameworks and the studies cited as being used as the basis for the IC research framework. The number of IC categories varies between one and six with different labels. For this study, 22 prior IC research frameworks are investigated, as listed in the second column. Three of these 22 IC research frameworks are mostly cited as the bases for the other 19: Guthrie and Petty (2000), Bontis (2003) and Bukh *et al.* (2005)

Table I.
Prior IC research frameworks under review

developing the IC research frameworks, sometimes with modifications or combinations across different approaches. The adaptation of a certain IC research framework for a content analysis of IC reporting may be driven by conceptual considerations, certain conditions given in the sample, certain author groups or trends in IC reporting research. As decisions on the IC research framework are usually not discussed in content analysis studies, subsequent researchers cannot deduce the reasons for modifications in the IC research frameworks. The IC research frameworks are often treated as given.

Some studies do not provide details of the IC research frameworks applied or else they omit to explain modifications to re-used IC research frameworks. This constitutes a problem of transparency. Justifications of why adopted IC research frameworks have been modified are rarely discussed. García-Meca and Martínez (2007), for example, altered Bukh *et al.*'s (2005) framework without providing reasons for their changes. Other studies introduce their IC research frameworks as being based on prior studies but numerous amendments may actually result in different approaches. While, for example, Hidalgo *et al.* (2011) claim to have adopted García-Meca *et al.*'s (2005) approach, the number of IC-related items differs and the classification of IC categories is changed without presenting the final framework for comparison. Consequently, the situation regarding the stage of IC research frameworks is unclear. In order to investigate the compositions of prior IC research frameworks in more detail, this study further examines the IC items included in prior IC research frameworks.

2.4 Synopsis of IC items in IC research frameworks

Numerous IC research frameworks have been developed for different IC reporting studies over time. The 22 IC research frameworks reviewed for this study are considered to represent a reasonable overview. Additional studies are highly likely to have also adopted or adapted IC research frameworks being based on the influential studies by Guthrie and Petty (2000), Bontis (2003) or Bukh *et al.* (2005). Decisions on re-using IC research frameworks of prior studies are also based on the same authors or author groups, as indicated by Dumay and Cai (2014) regarding general aspects of content analysis studies. They also mention that additional less cited recent studies represent a less relevant stage of other studies. Based on these considerations, this study does not consider additional IC research frameworks, compared to the chosen 22 studies, to offer further insights. In this section, the 22 research frameworks, shown in Table I, are compared in more detail on the level of IC items considered in the IC research frameworks. The IC items considered in these prior IC research frameworks are compiled in a synopsis, shown in Table II, where repeating IC items are added up according to their occurrences across the 22 prior IC research frameworks.

One issue arising from this synopsis is that IC items are classified differently across prior IC research frameworks. While some IC items are allocated to a certain category in one IC research framework, they are classified differently in others. One example is that Guthrie and Petty (2000), Lee and Guthrie (2010), among others, assign "financial relations" to structural capital while "financial relations" are attributed to relational capital by, for example, Bozzolan *et al.* (2003) and Vandemaele *et al.* (2005). It is difficult to define appropriate boundaries between IC categories. Mouritsen (2009) highlights contentious points at the boundaries between categories. Employee training on technology systems, for example, could be categorised as either human or structural capital. Furthermore, he argues that interactions between IC items make it difficult to attribute individual items to certain categories. This may partly explain how different

Structural capital		Relational capital		Human capital	
Corporate culture	*22*	*Business collaborations*	*19*	*Education*	*17*
Information systems	*19*	*Brands*	*18*	*Work-related knowledge*	*17*
Networking systems	*18*	*Customers*	*18*	*Training*	*14*
Intellectual property	*17*	*Distribution channels*	*14*	*Know how*	*13*
Management process	*15*	*Company reputation*	*11*	*Work-related competencies*	*12*
Management philosophy	*12*	*Licensing agreements*	*11*	*Employees*	*11*
Infrastructure	*11*	Customer involvement	10	*Vocational qualification*	*11*
Patents	*11*	Market presence	10	Development	9
Research projects	*11*	Franchising agreements	8	Diversity	9
Financial relations	9	Research collaborations	8	Employee value	9
Organisational learning	9	Customer loyalty	7	Expert teams	9
Technological processes	9	Customer relationships	7	Number of employees	9
Organisational structure	8	Customer training	7	Age	8
Knowledge sharing	7	Favourable contracts	7	Commitment and attitudes	7
Trademarks	7	Relationships with suppliers	7	Employee productivity	7
Copyrights	6	Company names	6	Entrepreneurial spirit	7
Efforts in working environment	5	Customer satisfaction	6	Professional experience	7
Innovation	5	Financial contacts	6	Skills	7
Management quality	5	Public relations	6	Employee benefits	6
Product development	5	Distribution network	5	Compensation plans	5
Quality management	5	Marketing	5	Equality	5
Business knowledge	4	Competitive intelligence	4	Expertise	5
Corporate university	4	Customer capital	4	Involvement with community	5
Economic value added	4	Customer retention	4	Motivation	5
Customer support function	4	Relations with stakeholders	4	Recruitment policy	5
Intellectual assets	4	Supplier knowledge	4	Career opportunities	4
Intellectual capital	4	Business agreements	3	Employee retention	4
Intellectual resources	4	Company awards	3	Expert network	4
Organisational flexibility	4	CSR activities	3	Human capital	4
Quality improvement	4	Diffusion and networking	3	Human resources	4
Distribution network	3	Quality standards	3	Job rotation opportunities	4
Knowledge management	3	Relational capital	3	Employees featured in AR	3
Production technology	3	Customer acquisition	2	Flexibility	3
Structural capital	3	Market leadership	2	Relationship	3
Accreditations	2	Brand development	1	Employee share and option plans	2
Business model	2	Brand recognition	1	Empowerment	2
Efficiency	2	Competition	1	Innovation	2
Leadership	2	Customer base	1	Union activity	2
New product success rate	2	Joint venture	1	Satisfaction	1
Operating systems	2	Market channels	1		
Production rates	2	Supply chain	1		
Methodologies	1				
Trade secrets	1				

Table II.
Synopsis of IC items in 22 prior IC research frameworks

Notes: This table shows a synopsis of IC items applied in 22 prior IC research frameworks, ranked by their occurrences across the IC research frameworks under review. IC items which are included in at least 11 out of the 22 IC research frameworks under review are considered as being widely used IC items and are highlighted in italic script

classifications have developed and how they continue to coexist across IC research frameworks. The varying classifications can be justified by taking different perspectives for the IC items and their contribution to structural, relational or human capital.

The occurrences across IC research frameworks provide a ranking of which IC items have been more widely used in prior studies. The synopsis of IC items shows that some items are widely used while certain items are only referred to in individual studies. For example, "methodologies" as structural capital item is only mentioned by Vergauwen *et al.* (2007) without explaining what this item contains. A concentration towards some more prominent IC items is recognisable. Corporate or organisational culture, for example, is referred to in all IC research frameworks reviewed in this study. The widely used IC items can be argued to represent more important items in IC reporting research compared to items which are rarely included in prior IC research frameworks. These widely used IC items seem to be more important in IC content analyses and give an indication for this study to investigate comparability of the results of prior studies. The proportions of widely used items to less-used items are relatively equal for all three IC categories. While about one-quarter of all IC items is used in at least half of the 22 IC research frameworks under review, the remaining three-quarters of IC items are referred to in only a few IC research frameworks.

2.5 Critique of content analysis on IC reporting

Content analysis studies on IC reporting have been reviewed and criticised in the literature. The studies by Dumay and Garanina (2013), Dumay (2014) and Dumay and Cai (2014) have reviewed the developments and achievements in IC research. These studies highlight the wide range of approaches and perspectives across prior IC reporting studies. In a critical review, Dumay (2014) examines the developments and achievements in IC research published over a period of nearly 15 years, highlighting the wide range of perspectives across prior studies. Dumay and Cai (2014) criticise IC content analyses as being illustrative rather than critical. They even challenge whether content analysis has a "continued role to play in developing new […] IC knowledge" (p. 265). Furthermore, in their review they call for innovative approaches and new ideas to utilise content analyses and to take these studies forward. This study suggests that one possibility to utilise the remarkable amount of prior IC content analyses could be to draw conclusions across the results of prior studies in meta-analyses. However, the differences in prior IC research frameworks may hinder conclusions across prior studies.

Abeysekera (2006) analyses methodological issues in IC content analysis studies. He questions comparability of the results of prior studies due to methodological aspects, such as sample compositions and decisions on content analysis procedures. The concern of non-comparability due to diverging procedures within IC content analyses is also raised by Beattie and Thomson (2007). Different decisions in the content analysis approach, such as counting occurrences of IC items with or without repetition in the narratives under review, various units of measurement and considerations of graphs, will result in different IC reporting scores. Hence, IC reporting scores are not directly comparable across studies with different content analyses procedures. However, the question arises whether different IC research frameworks may even result in effectively analysing different areas of IC reporting. As a certain degree of subjectivity is inherent in content analyses (Krippendorff, 2004), the differences in IC research frameworks may increase this subjectivity.

Dumay and Cai (2014) highlight that IC research frameworks are bound to be different due to different research settings. This thought raises the question of whether the results

of prior studies being based on different IC research frameworks are comparable, if not for absolute IC scores then at least in rankings and key findings. The widely used IC items across prior studies show the focus on certain IC items within IC research. However, if IC reporting in practice does not share this focus, the results from different IC research frameworks may diverge strongly. This consideration highlights the importance of IC research frameworks in the IC content analysis. To investigate this important aspect of IC content analyses, this study focuses on IC research frameworks which are normally referred to in the appendix of prior studies and which have not been investigated in detail in the IC literature. This study contributes to the IC reporting literature of content analyses by investigating the comparability of the results of prior IC content analyses regarding ranking and key findings in the IC reporting scores. If this study can show that prior results are comparable despite differences in the IC research frameworks, meaningful meta-analyses can be conducted to utilise the amount of prior IC content analyses. By drawing conclusions across prior IC reporting studies based on rankings and key findings, IC reporting research can be enhanced.

3. Research design

3.1 Sample

Germany offers a unique research setting for this study because German listed companies are required to publish a management report with additional narrative information referring to IC-related information (GASC, 2010). Therefore, a sample of German management reports is seen to be appropriate to investigate comparability of IC reporting results as the mandatory management report provides a comparable data set for an IC content analysis. The sample for this study comprises consolidated management reports for the financial year 2010 of 428 companies listed on the German stock exchange on 30 December 2010. The sample consists of German companies with available financial reports after excluding companies with data availability issues, short financial years and initial listings in 2010. As all sample companies are required to publish the management report in German, the management reports are investigated in German as the original language version.

3.2 IC research framework applied

As indicated in Guthrie and Petty (2000), different reporting environments require adjustments of IC research frameworks to country-specific or language issues. Therefore, this study conducts a pilot study with manual coding of ten management reports to develop an IC research framework for the German setting. The ten pilot companies are selected from different industries and sizes from the total sample in order to cover a wide range of potential IC references in different corporate settings. The ten pilot management reports are scrutinised for the IC items listed in the synopsis of prior IC research frameworks, shown in Table II. To account for country and language characteristics of the German setting in the IC research framework, the pilot study investigates references to IC items in actual reporting practices. The ten sample companies referred to the majority of IC items listed in the synopsis. These items are included in the IC research framework for this study while items which were not found to be reported by the pilot companies are not considered. Additionally, further IC-related items occurred in the pilot management reports, which seem to be specific for the German setting and are incorporated in the IC research framework for this study. These additional IC items mainly refer to product competencies, control mechanisms, research results, brand strategy, training arrangements and opportunities, working

environment and human resource policies. Table III shows the IC research framework applied in this study.

3.3 Content analysis procedures

To investigate the comparability of results due to differences in prior IC research frameworks, this study applies the same content analysis procedures for different combinations of IC items. This study conducts a content analysis, allowing repeated

Structural capital	Relational capital	Human capital
Corporate culture	**Business collaborations**	**Education**
Information systems	**Brands**	**Work-related knowledge**
Networking systems	**Customers**	**Training**
Intellectual property	**Distribution channels**	**Know how**
Management process	**Company reputation**	**Work-related competencies**
Management philosophy	**Licensing agreements**	**Employees**
Infrastructure	Customer involvement	**Vocational qualification**
Patents	Market presence	Development
Research projects	Franchising agreements	Diversity
Organisational learning	Research collaborations	Employee value
Technological processes	Customer loyalty	Expert teams
Organisational structure	Customer relationships	Number of employees
Knowledge sharing	Customer training	Age
Trademarks	Favourable contracts	Commitment and attitudes
Copyrights	Relationships with suppliers	Employee productivity
Innovation	Customer satisfaction	Graduates
Management quality	Financial contacts	Entrepreneurial spirit
Product development	Public relations	Professional experience
Quality management	Distribution network	Skills
Intellectual assets	Marketing	Employee benefits
Intellectual resources	Competitive intelligence	Compensation plans
Quality improvement	Customer capital	Equality
Knowledge management	Customer retention	Expertise
Production technology	Relations with stakeholders	Motivation
Efficiency	Supplier knowledge	Recruitment policy
New product success rate	Business agreements	Career opportunities
Operating systems	CSR activities	Employee retention
Production rates	Diffusion and networking	Expert network
Trade secrets	Customer acquisition	Human resources
Product competencies	Market leadership	Job rotation opportunities
Control mechanisms	Brand development	Flexibility
Strategic planning	Brand recognition	Relationship
Planning and control systems	Competition	Satisfaction
Workflow management	Joint ventures	*Training arrangements*
Process optimisation	Customer base	*Training opportunities*
Software development	Market channels	*Working environment*
Data processing	Supply chain	*Working safety*
Communication	*Network of suppliers*	*Occupational safety*
Research results	*Brand strategy*	*HR policies*

Notes: This table shows the IC research framework for the IC content analysis applied in this study. IC items which are widely used in prior IC research frameworks are highlighted in bold print. Additional IC items which are considered in the IC research framework of this study but not in the synopsis of prior IC research frameworks, shown in Table II above, are highlighted in italic script

Table III.
IC research framework for content analysis in this study

occurrences of IC items to count equally to first-time references. Hence, this study counts IC scores with repetitions, because counting without repetition of occurrences may be too simplistic, as counting without repetitions is also criticised by Beattie and Thomson (2007). This study focuses on narrative information because categorising graphs and tables with regards to their IC contents may be too subjective for the purpose of this study. Distinctive features of the German language are compound words where several nouns can be linked together to a single term. This property of the German language allows using words as unit of measurement considering their context sensitivity for IC coding. The language-dependent situation ensures a relatively high level of reliability for correct coding within the IC context as the compound words show the context for the items under review. Hence, IC reporting scores are the sum of words that refer to the respective IC items. To account for differences in reporting length the IC scores are scaled by the number of pages of the management reports.

The content analysis for this study applies a software-aided approach, using *atlas.ti*. Although software-aided coding has been criticised by Weber (1985) or Beattie and Thomson (2007), it has also been argued to have advantages for IC content analyses. The software-aided approach increases the degree of coding reliability and continuity, as argued by Krippendorff (2004). Furthermore, Dumay and Cai (2014) as well as Lee and Guthrie (2010) refer to software-aided coding as having potential for enhancing IC content analysis studies. To measure reliability, Krippendorff's α is applied in this study, following the measure defined by Krippendorff (2004). As Krippendorff (2004) argues that only values above 0.80 indicate reliability, this study targets values for Krippendorff's α to be above 0.80. To ensure reliability of the software-aided analysis, the results of the software-aided coding were compared with manual coding for eight management reports. After the first coding approach, the codes were changed and double checked, with Krippendorff's α improving from 0.791 to 0.857, which is considered to be reasonable. To increase transparency, Table IV summarises the content analysis procedures applied in this study. The considerations are based on the aspects outlined by Beattie and Thomson (2007).

3.4 Investigating widely used IC items

For the content analysis, the IC reporting scores are captured separately for individual IC items in the IC research framework. This approach allows comparing the proportion of IC scores for certain IC items within the total IC reporting scores resulting from the full IC research framework, presented in Table III. As the synopsis of prior IC research frameworks above shows a focus on some IC items which are widely used across prior IC research frameworks, this study first examines these widely used IC items. The individual IC reporting scores for these widely used IC items are compared to the resulting IC scores for the full IC research framework. This analysis shows whether the IC items which are widely used by researchers in defining their IC research framework are also widely referred to in corporate IC reporting. Hence, the design of this study allows investigation of the role of the widely used IC items in capturing IC reporting. If the widely used IC items actually account for the majority of IC reporting scores, the focus on certain aspects of IC is similar between researchers and reporting companies.

This study defines as widely used IC items those IC items which are included in more than half of the prior IC research frameworks under review. Hence, widely used IC items are applied by not less than 11 out of the 22 IC research frameworks under review, as presented in Table II. These widely used items are nine items for

Considerations	Procedures applied in this study
Unit of analysis and measurement	Words are coded and counted as IC disclosure units Only narrative information is counted, non-narrative disclosure is not considered Headings and highlighted text are considered to be equivalent to standard text
Volume of disclosure	Count of occurrences with repetitions Scaled by pages or total words to account for document length
Type of disclosure	Quantitative and qualitative information are not distinguished For graphs and tables only narrative information is considered as IC words appear
Location of disclosure	Section of annual reports headed "Management Report" No further consideration of location within management report
Language of disclosure	German as original language for the sample of German companies German compound words carry inherent context meaning
Coding device	Software-aided coding, using *atlas.ti*
Reliability checks	Krippendorff's α calculated to measure reliability Krippendorff's $\alpha = 1-(D_o/D_e)$, where $D_o =$ observed disagreement; $D_e =$ expected disagreement Electronic codes double checked with manual coding of eight management reports to improve coding, Krippendorff's α improved from $\alpha = 0.791$ to $\alpha = 0.857$

Notes: To increase the transparency of the content analysis, this table shows a summary of the procedures of the content analysis approach applied in this study. The considerations to describe the content analysis procedures are based on the outline by Beattie and Thomson (2007) for designing a content analysis

Table IV.
Summary of content analysis procedures applied in this study

structural capital: corporate culture, information systems, networking systems, intellectual property, management process, management philosophy, infrastructure, patents and research projects. For relational capital the widely used items are the following six items: business collaborations, brands, customers, distribution channels, company reputation and licensing agreements. For human capital seven items are widely used: education, work-related knowledge, training, know how, work-related competencies, employees and vocational qualification.

3.5 Correlation analysis of IC items

The scores for the individual widely used IC items are further analysed to investigate the comparability of the results of prior IC content analyses. The comparison of IC reporting scores for widely used items and for all IC items, as described above, shows the overall role of widely used IC items. However, as prior IC research frameworks included different combinations of widely used IC items, the question arises whether IC reporting results from IC research frameworks are comparable. Therefore, the resulting IC scores for the individual IC items in the German data set are aggregated in different combinations of the widely used IC items for structural, relational and human capital. The different combinations of widely used IC items are chosen to represent a variety of combinations which are found in prior IC research frameworks. The chosen combinations of widely used IC items are applied, for example, in the following prior IC research frameworks: Vergauwen *et al.* (2007), Guthrie *et al.* (2007), Mangena *et al.* (2010), Bukh *et al.* (2005) and Brüggen *et al.* (2009). The aggregated IC reporting scores

for the different combinations of widely used IC items and the total IC reporting scores are tested for correlation to indicate comparability of IC reporting results. Correlation values above 0.70 are seen to indicate comparability of IC reporting results as they are commonly acknowledged to represent a strong positive linear relationship.

4. Results

4.1 Role of widely used IC items

To consider the role of the widely used IC items within the full IC research framework, the IC reporting scores for the widely used IC items are compared to the total IC reporting scores. The full IC research framework is used for the IC content analysis, as shown in Table III, capturing individual IC scores for the listed IC items. The widely used IC items result from the synopsis of prior IC research frameworks in Table II and represent the items used in 11 out of the 22 IC research frameworks under review. The IC reporting scores for the widely used items are aggregated and compared to the total IC scores. Table V shows the results of this comparison for each IC category. The reporting scores are scaled by number of pages to account for document length. The percentages show the proportions of IC reporting scores for the aggregated widely used IC items compared to the total IC scores for each IC category. The results indicate that the widely used IC items play an important role in the IC research framework.

The findings show that the reporting scores of the widely used IC items account for the majority of total reporting scores for each IC category. For total IC, about 8.58 words on every page refer to IC; 5.13 out of these words refer to widely used IC items. At the category

$n = 428$		Total items	Widely used items
Total IC	Mean	8.58	5.13
(117 total items; 22 widely used items)	% of total		59.8
	SD	3.44	2.15
	Min.	0.00	0.00
	Max.	28.82	17.23
Structural capital	Mean	3.55	2.19
(39 total items; 9 widely used items)	% of total		61.8
	SD	1.54	1.06
	Min.	0.00	0.00
	Max.	11.92	9.81
Relational capital	Mean	3.19	1.72
(39 total items; 6 widely used items)	% of total		54.0
	SD	1.75	1.22
	Min.	0.00	0.00
	Max.	15.00	10.65
Human capital	Mean	1.84	1.22
(39 total items; 7 widely used items)	% of total		66.0
	SD	0.88	0.60
	Min.	0.00	0.00
	Max.	5.98	4.08

Table V.
Reporting scores for full IC research framework and widely used IC items

Notes: This table shows the results of the content analysis conducted on 428 German management reports for the financial year 2010. The findings represent occurrences per page for total IC and for the aggregated scores of widely used IC items by categories structural, relational and human capital. The widely used IC items, considered in at least 11 out of 22 IC research frameworks under review, account for the majority of IC reporting scores, playing a major role in the IC research framework

level, about 60 per cent of structural capital reporting is captured by the nine widely used items compared to all 39 structural capital items. For relational capital, the six widely used items account for more than half of all reporting scores. Human capital reporting is covered to more than 60 per cent by the seven widely used human capital items. Considering the amount and variety of previously used IC items, the findings are meaningful for IC reporting research. These results suggest that if IC research frameworks focus on the relatively few widely used IC items, they already capture more than half of all IC reporting. Two main conclusions can be drawn from these findings. First, companies seem to focus on the same widely used IC items as IC researchers because corporate IC reporting mainly refers to these items for each IC category. Second, the wide range of remaining IC items considered in the prior IC research frameworks, for each category in Table II, seems to be excessive for capturing less than half of all IC reporting scores.

4.2 Comparability of results of prior content analysis studies

For the comparability analysis of the results of prior studies, different combinations of widely used IC items in prior IC research frameworks are tested for correlation, based on the German data set. Significantly high correlation values above 0.70 show a high degree of linear relationships for the IC reporting scores resulting from different combinations of widely used IC items. Based on the role of widely used IC items in capturing the majority of IC reporting, the correlation analysis is expected to show that IC reporting scores are highly correlated if the most widely used IC items are included in the different combinations. Accordingly, the remaining IC items captured in the total IC reporting scores are expected to be of lesser importance. Hence, if less widely used items are omitted in the IC content analysis, the reporting scores should still be highly correlated. Therefore, the correlation values for total reporting scores and for all widely used IC items are anticipated to be significantly high for each IC category, indicating comparability. The correlation results are presented in Table VI.

The combinations of widely used IC items are chosen to represent different varieties of widely used items as applied in different prior studies. For structural capital, the correlation values are relatively low if the widely used items are not fully included. Only for combinations 1 and 4, as applied in the IC research frameworks by Vergauwen *et al.* (2007) and by Bukh *et al.* (2005), are the correlation values for total structural capital above 0.70. This result is unexpected because the latter combination omits several widely used structural capital items. Other combinations where fewer items are omitted out of the nine widely used ones, such as combination 3, as applied by Mangena *et al.* (2010), are less highly correlated to the scores for total structural capital. This divergence in correlations indicates that the nine most widely used items are not equally important for capturing structural capital reporting. The low correlation values between combinations 4 and 3 suggest that results for structural capital reporting focusing on these widely used structural capital items are not directly comparable. The correlation values between total structural capital and combination 1, where all nine widely used structural capital items are included, show high significant correlation values.

The correlation tables for relational and human capital are more conclusive. For relational capital, the reporting scores are significantly highly correlated to total relational capital for all but one combination of widely used items where almost all widely used items are omitted. This combination of widely used relational capital items is applied by Brüggen *et al.* (2009). Although combinations 2 and 3 omit one and combination 4 even omits two of the widely used relational capital items, the correlation values are

Table VI.
Correlation results for IC scores based on combinations of IC items

Panel A: analysis for structural capital

	Widely used structural capital items								
Combinations applied in prior studies	Corporate culture	Information systems	Networking systems	Intellectual property	Management process	Management philosophy	Infrastructure	Patents	Research projects
1 Vergauwen *et al.* (2007)	x	x	x	x	x	x	x	x	x
2 Guthrie *et al.* (2007)	x	x	x	x	x	x			
3 Mangena *et al.* (2010)	x		x	x	x	x	x		
4 Bukh *et al.* (2005)	x	x	x					x	x
5 Brüggen *et al.* (2009)	x	x		x					
Correlation results ($n = 428$)	Total	1	2	3	4	5			
Total structural capital	1	0.86*	0.68*	0.64	0.78*	0.63*			
Combination 1	0.85*	1	0.75*	0.69	0.89*	0.69*			
Combination 2	0.64*	0.75*	1	0.91	0.42*	0.81*			
Combination 3	0.59*	0.69*	0.91*	1	0.28*	0.55*			
Combination 4	0.77*	0.89*	0.42*	0.28	1	0.55*			
Combination 5	0.59*	0.69*	0.81*	0.55	0.55*	1			

Panel B: analysis for relational capital

	Widely used relational capital items					
Combinations applied in prior studies	Business collaborations	Brands	Customers	Distribution channels	Company reputation	Licensing agreements
1 Vergauwen *et al.* (2007)	x	x	x	x	x	x
2 Guthrie *et al.* (2007)	x	x	x	x		x
3 Mangena *et al.* (2010)	x	x	x	x	x	
4 Bukh *et al.* (2005)	x	x			x	x
5 Brüggen *et al.* (2009)					x	
Correlation results ($n = 428$)	Total	1	2	3	4	5
Total relational capital	1	0.91*	0.90*	0.92*	0.67*	0.37*
Combination 1	0.90*	1	1.00*	0.99*	0.77*	0.38*
Combination 2	0.89*	1.00*	1	0.99*	0.76*	0.34*
Combination 3	0.91*	0.99*	0.99*	1	0.75*	0.39*
Combination 4	0.67*	0.79*	0.78*	0.76*	1	0.41*
Combination 5	0.28*	0.26*	0.21*	0.27*	0.28*	1

(*continued*)

Table VI.

Panel C: analysis for human capital

	Widely used human capital items						
Combinations applied in prior studies	Education	Work-related knowledge	Training	Know how	Work-related competencies	Employees	Vocational qualification
1 Vergauwen *et al.* (2007)	x	x	x	x	x	x	x
2 Guthrie *et al.* (2007)	x	x	x			x	
3 Mangena *et al.* (2010)	x	x	x	x	x		x
4 Bukh *et al.* (2005)	x		x		x		
5 Brüggen *et al.* (2009)		x		x			
Correlation results ($n = 428$)	Total	1	2	3	4	5	
Total human capital	1	0.94*	0.91*	0.81*	0.74*	0.34*	
Combination 1	0.95*	1	0.97*	0.83*	0.76*	0.34*	
Combination 2	0.92*	0.97*	1	0.74*	0.71*	0.25*	
Combination 3	0.81*	0.85*	0.76*	1	0.91*	0.44*	
Combination 4	0.74*	0.77*	0.74*	0.93*	1	0.18*	
Combination 5	0.35*	0.36*	0.24*	0.45*	0.19*	1	

Notes: These tables show the chosen different combinations of widely used IC items applied in prior studies and the correlation results for the aggregated IC reporting scores for these different combinations by IC categories: structural capital (panel A); relational capital (panel B); and human capital (panel C). Pearson correlations are given in the lower left-hand corner and Spearman correlations are shown in the upper right-hand corner. x indicates which widely used IC items are included in which study. *Significant at 5 per cent

significantly high. Hence, the results on relational capital reporting for the IC research frameworks applied by Guthrie *et al.* (2007), Mangena *et al.* (2010) and Bukh *et al.* (2005) seem to be comparable. The correlation table for human capital reporting shows similar results. Although combination 3 omits one, combination 2 omits two and combination 4 omits even four of the seven widely used human capital items, they are still significantly highly correlated to the total human capital score as well as other combinations. Applying combination 5, as included in the IC research framework by Brüggen *et al.* (2009), provides reporting scores which are not correlated to any of the other combinations. Hence, the results of this IC research framework, where five of the widely used human capital items are omitted, seem non-comparable to the other results.

The findings of the correlation analysis indicate that the results of prior studies are comparable in rankings and key findings, provided that most of the widely used IC items are included in the IC research framework. If an IC research framework were to neglect IC items which prior literature has rarely used, the findings would not diverge greatly in rankings and key findings. However, if an IC research framework were to exclude the most widely used IC items for the respective categories, the results might not be comparable to the results of other IC reporting studies. As the IC research framework applied by Brüggen *et al.* (2009) omits most of the widely used IC items for each category, their results may diverge from other studies. These findings support the conclusion that inferences across the results of prior studies may enhance IC reporting research in meta-analyses if most of the widely used IC items are included in the prior IC research frameworks.

5. Conclusion

The aim of this study is to investigate whether the results of prior content analysis studies on IC reporting are comparable despite differences in their IC research frameworks. Prior studies on content analyses of IC reporting have been conducted for over a decade using different IC research frameworks for different research settings. In a critical review, Dumay and Cai (2014) called for new ideas to enhance and enrich IC research. This study suggests that conclusions can be drawn across the results of prior content analyses in meta-analysis studies in order to utilise the plenty of prior content analysis studies. However, the differences in prior IC research frameworks may cause the results of prior IC content analyses to be non-comparable. Therefore, this study focuses on investigating IC research frameworks applied in prior IC content analyses to investigate the comparability of prior IC reporting results.

To achieve the research aim, this study conducts a software-aided content analysis on a sample of 428 German management reports. The IC research framework applied in this study is based on the synopsis of prior IC research frameworks and the findings of a pilot study, analysing IC reporting of ten sample companies, for adequate adaptations to the German sample. The IC reporting scores are captured for the individual IC items in order to analyse the role of IC items are identified to be widely used in the synopsis of prior IC research frameworks. This approach allows examining whether corporate IC reporting focuses on the same IC items as IC research. Furthermore, a correlation analysis is conducted to investigate the relationship of IC reporting scores for different combinations of these widely used IC items. High correlation values indicate that the results of prior studies are comparable if the widely used IC items are included in the IC research frameworks. The findings of this study show that the widely used IC items capture the majority of IC reporting for all three IC categories. Hence, these IC items play an important role in the IC research framework as companies also focus on

these widely used IC items in their IC reporting. The high correlation values indicate that the results of prior studies are comparable regarding rankings and key findings as long as most of the widely used IC items are included in prior IC research frameworks.

This study is subject to limitations. The analysis of this study investigates differences across prior IC research frameworks and the included IC items, but does not consider differences in the procedures of the content analyses. Therefore, this study shows that prior results can be compared regarding rankings and key findings rather than absolute IC reporting scores. Furthermore, this study applies different combinations of widely used IC items to a German data set. The focus on certain IC items in actual IC reporting practices may vary in other research settings. Therefore, this study suggests future research could examine the role of the identified widely used IC items in other research settings to make the findings more generalisable.

The findings of this study contribute to IC research as they suggest that the results of prior studies can be compared, contrasted and included in meta-analyses. This will enhance IC reporting research, as the remarkable amount of prior content analyses can be utilised to develop IC-related hypotheses and theories. Therefore, this study strongly encourages meta-analysis studies of prior IC content analyses for future research. The findings of this study suggest that the literature on content analysis of IC reporting has not reached a dead end. Although the plethora of prior IC content analyses has been criticised, this study suggests that the IC reporting literature can be taken forward by utilising this plethora of IC content analyses in different research settings. As the results of prior studies are comparable regarding rankings and key findings, inferences and conclusions are possible across prior studies. In this manner, this study responds to the call by Dumay and Cai (2014) by suggesting a new idea to enhance IC reporting research.

References

Abeysekera, I. (2006), "The project of intellectual capital disclosure: researching the research", *Journal of Intellectual Capital*, Vol. 7 No. 1, pp. 61-77.

Abeysekera, I. and Guthrie, J. (2005), "An empirical investigation of annual reporting trends of intellectual capital in Sri Lanka", *Critical Perspectives on Accounting*, Vol. 16 No. 3, pp. 151-163.

Beattie, V. and Thomson, S.J. (2007), "Lifting the lid on the use of content analysis to investigate intellectual capital disclosures", *Accounting Forum*, Vol. 31 No. 2, pp. 129-163.

Bontis, N. (2003), "Intellectual Capital Disclosure in Canadian Corporations", *Journal of Human Resource Costing & Accounting*, Vol. 7 Nos 1/2, pp. 9-20.

Bozzolan, S., Favotto, F. and Ricceri, F. (2003), "Italian annual intellectual capital disclosure. An empirical analysis", *Journal of Intellectual Capital*, Vol. 4 No. 4, pp. 543-558.

Brennan, N. (2001), "Reporting intellectual capital in annual reports: evidence from Ireland", *Accounting, Auditing & Accountability Journal*, Vol. 14 No. 4, pp. 423-436.

Brooking, A. (1996), *Intellectual Capital: Core Asset for the Third Millennium Enterprise*, International Thomson Business Press, London.

Brüggen, A., Vergauwen, P. and Dao, M. (2009), "Determinants of intellectual capital disclosure: evidence from Australia", *Management Decision*, Vol. 47 No. 2, pp. 233-245.

Bukh, P.N., Nielsen, C., Gormsen, P. and Mouritsen, J. (2005), "Disclosure of information on intellectual capital in Danish IPO prospectuses", *Accounting, Auditing & Accountability Journal*, Vol. 18 No. 6, pp. 713-732.

Campbell, D. and Rahman, M. (2010), "A longitudinal examination of intellectual capital reporting in Marks & Spencer annual reports, 1978-2008", *The British Accounting Review*, Vol. 42 No. 1, pp. 56-70.

Cerbioni, F. and Parbonetti, A. (2007), "Exploring the effects of corporate governance on intellectual capital disclosure: an analysis of European biotechnology companies", *European Accounting Review*, Vol. 16 No. 4, pp. 791-826.

Dumay, J.C. (2014), "15 years of the journal of intellectual capital and counting: a manifesto for transformational IC research", *Journal of Intellectual Capital*, Vol. 15 No. 1, pp. 2-37.

Dumay, J.C. and Cai, L. (2014), "A review and critique of content analysis as a methodology for inquiring into IC disclosure", *Journal of Intellectual Capital*, Vol. 15 No. 2, pp. 264-290.

Dumay, J.C. and Garanina, T. (2013), "Intellectual capital research: a critical examination of the third stage", *Journal of Intellectual Capital*, Vol. 14 No. 1, pp. 10-25.

Edvinsson, L. and Malone, M.S. (1997), *Intellectual Capital : The Proven way to Establish Your Company's Real Value by Measuring its Hidden Brainpower*, Piatkus, London.

García-Meca, E. and Martínez, I. (2007), "The use of intellectual capital information in investment decisions – an empirical study using analyst reports", *The International Journal of Accounting*, Vol. 42 No. 1, pp. 57-81.

García-Meca, E., Parra, I., Larrán, M. and Martínez, I. (2005), "The explanatory factors of intellectual capital disclosure to financial analysts", *European Accounting Review*, Vol. 14 No. 1, pp. 63-94.

GASC (2010), *German Accounting Standard No. 15 (GAS 15) – Management Report*, German Accounting Standards Committee (GASC), Berlin.

Guthrie, J. and Petty, R. (2000), "Intellectual capital: Australian annual reporting practices", *Journal of Intellectual Capital*, Vol. 1 No. 3, pp. 241-251.

Guthrie, J., Petty, R. and Ricceri, F. (2007), *Intellectual Capital Reporting: Lessons from Hong Kong and Australia*, The Institute of Chartered Accountants of Scotland, Edinburgh.

Guthrie, J., Ricceri, F. and Dumay, J.C. (2012), "Reflections and projections: a decade of intellectual capital accounting research", *The British Accounting Review*, Vol. 44 No. 2, pp. 68-82.

Guthrie, J., Petty, R., Yongvanich, K. and Ricceri, F. (2004), "Using content analysis as a research method to inquire into intellectual capital reporting", *Journal of Intellectual Capital*, Vol. 5 No. 2, pp. 282-293.

Hall, R. (1992), "The strategic analysis of intangible resources", *Strategic Management Journal*, Vol. 13 No. 2, pp. 135-144.

Hidalgo, R., García-Meca, E. and Martínez, I. (2011), "Corporate governance and intellectual capital disclosure", *Journal of Business Ethics*, Vol. 100 No. 3, pp. 483-495.

Krippendorff, K. (2004), *Content Analysis : An Introduction to its Methodology*, 2nd ed., Sage Publications, Thousand Oaks, CA.

Lee, L.L. and Guthrie, J. (2010), "Visualising and measuring intellectual capital in capital markets: a research method", *Journal of Intellectual Capital*, Vol. 11 No. 1, pp. 4-22.

Li, J., Mangena, M. and Pike, R. (2012), "The effect of audit committee characteristics on intellectual capital disclosure", *The British Accounting Review*, Vol. 44 No. 2, pp. 98-110.

Li, J., Pike, R. and Haniffa, R. (2008), "Intellectual capital disclosure and corporate governance structure in UK firms", *Accounting and Business Research*, Vol. 38 No. 2, pp. 137-159.

Mangena, M., Pike, R. and Li, J. (2010), *Intellectual Capital Disclosure Practices and Effects on the Cost of Equity Capital: UK Evidence*, The Institute of Chartered Accountants of Scotland, Edinburgh.

Mouritsen, J. (2009), "Classification, measurement and the ontology of intellectual capital entities", *Journal of Human Resource Costing & Accounting*, Vol. 13 No. 2, pp. 154-162.

Roos, J., Roos, G., Edvinsson, L. and Dragonetti, N.C. (1997), *Intellectual Capital: Navigating in the New Business Landscape*, Palgrave Macmillan, London.

Singh, I. and Van der Zahn, J.-L.W.M. (2008), "Determinants of intellectual capital disclosure in prospectuses of initial public offerings", *Accounting and Business Research*, Vol. 38 No. 5, pp. 409-431.

Stewart, T.A. (1997), *Intellectual Capital : The New Wealth of Organizations*, Currency and Doubleday, New York , NY and London.

Striukova, L., Unerman, J. and Guthrie, J. (2008), "Corporate reporting of intellectual capital: evidence from UK companies", *The British Accounting Review*, Vol. 40 No. 4, pp. 297-313.

Sveiby, K.E. (1997), *The New Organizational Wealth : Managing & Measuring Knowledge-Based Assets*, Berrett-Koehler Publishers, San Francisco, CA.

Vandemaele, S.N., Vergauwen, P. and Smits, A.J. (2005), "Intellectual capital disclosure in The Netherlands, Sweden and the UK: a longitudinal and comparative study", *Journal of Intellectual Capital*, Vol. 6 No. 3, pp. 417-426.

Vergauwen, P. and van Alem, F. (2005), "Annual report IC disclosures in The Netherlands, France and Germany", *Journal of Intellectual Capital*, Vol. 6 No. 1, pp. 89-104.

Vergauwen, P., Bollen, L. and Oirbans, E. (2007), "Intellectual capital disclosure and intangible value drivers: an empirical study", *Management Decision*, Vol. 45 No. 7, pp. 1163-1180.

Weber, R.P. (1985), *Basic Content Analysis*, Sage, Beverly Hills, CA and London.