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Communicating Intellectual Capital:
Evidence from Social and Sustainability Reporting

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Introduction

The rise of knowledge economy has changed the key factors that drive company success (Eustace, 2001). Intellectual assets are increasingly recognized as the most important factors in achieving company objectives (Bukh *et al.*, 2001) and in the process of value creation (Asthon, 2005). This change has influenced the company communication process and the relevance of financial accounting metrics (Lev & Zarowin, 1999; Wallman, 1995, 1996; Holland, 2004) and a need for a more complete and transparent communication process has emerged (Blair & Wallman, 2001; Meritum, 2001; FASB, 2001; Upton, 2001; Mouritsen *et al.*, 2003).

Consequently, greater attention has been placed on the voluntary disclosure of intellectual capital made by companies in order to evaluate their communication behaviour towards the stakeholders. In particular intellectual capital disclosure (ICD) by the annual report has been analysed in several countries. So far less attention has been put on ICD in other forms of company reporting caused a partially analysis of the overall ICD company communication process (Unerman *et al.* 2007). However, the importance of analysing different types of company reports besides the annual report is widely recognized in literature. Lev & Zambon (2003) claim that the relationship between IC statements and other forms of company reports should be explored in depth. Gray (2006) underlines that the analysis of annual report disclosures has been widely investigated and therefore there is the need to focus the research towards other types of report. Recently Striukova *et al.* (2008) show how the ICD in the annual report cannot be taken as a proxy for the overall pattern of company ICD and support the idea of analyzing the ICD in different types of company reports in order to identify a more representative picture of company intellectual capital reporting practices.

The aim of this paper is to contribute to the understanding of the ICD company practices through a longitudinal content analysis over two years (2005-2006) of separate social and sustainability reports of 37 Italian listed companies. The paper allows analysts to investigate ICD in a specific typology of report used by the company to communicate with its stakeholder (McInnes *et al.*, 2007) and it contributes to the debate relating to ICD analysis through different types of company reports. ICD will be analysed in terms of frequency and quality to understand in depth the characteristics of IC information communicated by social and sustainability reports. In particular ICD quality will be analysed through a multidimensional framework composed by three main disclosure profiles (time orientation, financial/non-financial, quantitative/non quantitative) which allow to develop a quality disclosure index.

The results show an increasing level of disclosure over time; relational capital is the most reported category followed by human capital while organizational capital shows the higher increase rate. ICD is communicated principally in non financial, quantitative and non time specific terms and the quality disclosure index shows a good (but variable) level of disclosure.

The paper is structured as follows: the first section starts with a brief analysis of company voluntary disclosure followed by a deeper analysis of the empirical ICD studies on public communication channels; this allows us to identify the key characteristics of previous research and locate this study and its contribution within the extant literature. The second section explains how the sample of reports analysed has been constructed, the content analysis research method used to conduct the empirical research and the framework used to

classify and analyse ICD. Section three contains the ICD analysis and in the final section the main conclusions are summarised and the key limitations of the study are discussed.

1. Voluntary disclosure of intangibles

In IC literature several frameworks and guidelines have been developed for measuring and reporting IC (Bontis *et al.,* 1999; Bontis, 2001; Sveiby, 2002; Meritum, 2002; Mouritsen *et al.*, 2003; Ricceri, 2008) and several studies have been made to identify and analyze voluntary ICD. As Lev (1992) pointed out, voluntary disclosure can be defined as the "*information releases which are not required by laws and regulation*" and it can generate both advantages and disadvantages for a company. According to Cooke (1989), when a firm chooses to make voluntary disclosures, it can reasonably be assumed that the benefits are perceived to exceed the costs. In general, voluntary disclosure can help investors and creditors to better understand the company's economic risk profile. In the accounting literature is showed that positive voluntary disclosure effects are the reduction of information asymmetry (Lang & Lundholm, 2000; Lev, 1992) which leads to a reduction of the risk of investing in the reporting company, a better efficient investment decisions (Gray, Radebaugh & Robert, 1990; Garcia Meca & Martinez, 2007) and more accurate analysts' forecast (Lang & Lundholm, 1996; Garcia Ayuso, 2003). Other perceived benefits are the improvement of stock performance (Dumay & Tull, 2007; Healey *et al.,* 1999; Lajili & Zéghal, 2006), the reduction of the cost of equity (Botosan & Plumblee, 2002; Kristandl & Bontis, 2007) and the reduction of cost of issuing debt (Sengupta,1998).
Among the disadvantages, voluntary disclosure can be costly in term of preparing and disseminating additional information (Lev, 1992), and can be constraint by the fear to revealing proprietary information to competitors (Graham *et al*., 2005). Voluntary disclosure can also produce a competitive disadvantage because information about innovation, strategy and operations can reduce the company's expected future cash flows by aiding its competitors (Edwards & Smith, 1996; Elliot & Jacobson, 1994).

Previous studies of ICD by public channels
According to Garcia Meca *et al.* (2005) intellectual capital disclosure is made through different communication channels. Public channels, such as annual reports and accounts, interim reports, initial public offering (IPO), websites, intellectual capital statement, environmental and Corporate Social Responsibility (CSR) reports, are oriented to inform a broad set of company stakeholders, while private channels, such as one-to-one meetings, presentations to financial analysts and conference calls, are oriented towards the company stakeholder that are more interested in the value creation process.
In investigating ICD, the company annual report has been the most widely used document due to its high degree of credibility (Unerman, 2000; Abeysekera, 2006). ICD in the annual report has been analyzed since Guthrie & Petty's (2000) work, which founded that IC elements are inconsistently and minimally reported by Australian companies. After this research several studies have been made to analyse the ICD in the annual report in a specific country. Brennan (2001) found that Irish companies disclose an extremely low level of IC with a strong emphasis on organizational capital. April *et al*. (2003) show that in South Africa the mining companies tend to focus more on external components of IC such as, business collaboration and favourable contracts, and less on internal capital and human capital. Bontis (2003) found that there is no disclosure for each dimension of IC in the annual report of Canadian companies while Bozzolan *et al.* (2003) pointed out that in the Italian companies annual report the external capital is the most reported category, with customers,

distribution channels, business collaboration and brands that are the most reported items. Also Goh & Lim (2004) found that, in Malaysia, the most disclosed IC category is the external capital followed by internal capital. They showed a low level of disclosure regarding patent, copyright, trademarks, franchising agreements, know-how and vocational qualifications. Different findings are showed by Oliveira *et al.* (2006) in the analysis of the Portuguese company annual report. They reveal that the external capital is the most reported dimension followed by human capital, while management process, employees, investors, networking system and customer are the main items reported. More recently in the analysis of Honk Kong companies annual report Guthrie *et al.* (2007) show that external capital and human capital are reported in similar ways while at category level they found that the most reported IC elements are employees and information/networking systems. Also Sujan & Abeysekera (2007) reveal that the Australian firms disclosure the external capital as the main category followed by the internal capital and, respect to the items, they show that the management philosophy and management processes are the most often disclosed while copyright, trademarks, franchising agreements and vocational qualification are the less. Moreover, as pointed out by Brennan (2001), they found that the IC information reported was mainly in qualitative terms. On the contrary Steenkamp (2007), shows that in New Zealand the company reported a high level of human capital and a low level of internal capital. Employee and work-related knowledge are the two main items disclosed. Table 1 summarises the frequencies (in percentage) of the disclosed level of internal, external and human capital in ICD studies based on Annual reports.

Table 1[1] - Frequencies of IC categories in ICD studies of annual report in specific countries

Study	Internal Capital	External Capital	Human Capital
Australia (Guthrie & Petty, 2000)	30%	40%	30%
Ireland (Brennan, 2001)	29%	49%	22%
Italy (Bozzolan *et al.*, 2003)	30%	49%	21%
South Africa (April et al., 2003)	30.4%	40.1%	29.5%
Malaysia (Goh & Lim, 2004)	36.4%	41.4%	21.9%
Portuguese (Oliveira *et al.*, 2006)	21%	49%	30%
Australia (Sujan & Abeysekera, 2007)	31%	48%	21%
Honk Kong (Guthrie et al., 2007)	28%	37%	35%
New Zealand (Steenkamp, 2007)	11%	36%	53%

Furthermore longitudinal studies of annual report has been performed to analyze the trend of voluntary ICD. Williams (2001) shows that there was a significant increase of ICD in UK public listed company of the FTSE-100 over the five years period surveyed (from 1996 to 2000). Olsson (2004) reveals an increasing disclosure trend in 15 Swedish companies of the retail sector from 1998 to 2002 and, contrary to the previous studies findings, he reveals that organizational capital is the most reported followed by the relational capital. Abeysekera &

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[1] Bontis (2003) has not been inserted in the table because it does not provide numerical evidence of the results.

Guthrie (2005) analysed the disclosure of IC made by the Sri Lanka companies for two years. They found and increasing level of disclosure for the period analysed and showed that the most highly reported is the relational capital followed by the human capital. Vandemaele *et al.* (2005) confirm the increasing trend of ICD in the analysis of Netherlands and UK companies annual report, and the dominance of the external capital as the main category reported. Recently also Sonnier *et al.* (2008) confirm the longitudinal increase in the overall level of ICD in the annual report of 15 American companies operating in the manufacturing sector and the relational capital followed by organizational capital as the two major dimensions reported. An exception is the work of Abdolmohammadi (2005) which only partially confirms the increase in the ICD in the annual report of an American company during the time period under examination; in particular, the study shows that only for brand and proprietary process there is a statically significant change over the year. Overall, these collection of longitudinal studies reveals an increasing in the annual report ICD elements over time and therefore support the hypothesis of a growth of attention by the company towards the IC disclosure in the last decade. In relation to ICD in the annual report some studies have analysed only a specific dimension of IC such as the human capital (Abeysekera & Guthrie, 2004; Vuontisjärvi, 2006) others, instead, have conducted an international comparative analysis (Vandemaele *et al.*, 2005; Vergauwen and Alem, 2005; Bozzolan *et al.,* 2006; Guthrie *et al.*, 2006) while Gerpott *et al.* (2008) have compared the ICD quality between annual reports and websites for a sample of 29 international stock-quoted telecommunications network operators. The results show that the level of ICD is significantly and positively link with the two types of documents and that IC information is rarely reported and principally communicated in qualitative terms.

ICD by public channels have been also analyzed within the initial public offering prospectuses. Bukh *et al.* (2005) show that the ICD in Danish IPO prospectuses has increased substantially from 1999 to 2001 especially for the companies operating in high-tech sector which communicated more non-accounting information to reduce the information asymmetry between the companies and external stakeholders. Also Cordazzo (2007) investigates the ICD in IPO of Italian companies between the period 1999-2002. The results show that the amount of IC information has increased over the period and suggest that intangible information can be used by the company's manager to improve the investor decision-making process when a firm enters in the stock market.

Finally ICD has been analyzed in the environmental, social and sustainability reports. Cordazzo (2005) focuses the attention on 83 environmental and social reports which reveal a good presence of IC information, such as employee training, customer satisfaction, supplier characteristic, which are communicated both in qualitative and quantitative form. Pedrini (2007) highlights the presence of human capital information on sustainability reports: the results show a large overlapping of indicators between intellectual capital report and sustainability report, in particular related to the description of human capital characteristics, the measurement of the quality and intensity of training and the reporting on diversity and opportunity.

The lack of proactive behaviour by companies in attempting to measure and report externally IC (Guthrie & Petty, 2000) and the lack of transparency in the application of the content analysis can be considered as the key limitations of previous research. Beattie & Thompson (2007) stress that different results can be caused by a low level of transparency regarding the detailing coding rules used to allocate information to IC categories and by the absence of an established and comprehensive ICD framework. Also Abeysekera (2006) points out the difficulty of comparing ICD studies and states that the main limitations are the operational definitions of IC items in the coding framework, the level of detail on which IC items were

examined and the differentiation in the companies sample. In general can be difficult to make a comparison between previous studies (Steenkamp, 2007).

Despite the aforementioned limitations the research shows that the level of IC disclosure tend to be "low" but increasing in a time, that IC information is communicated mainly in qualitative terms (Beattie *at al.,* 2004; Guthrie *et al.,* 2007) and it is influenced by sector and company size.

Analyzing previous literature the most disclosure category is external capital and the most used document to analyze ICD is the annual report. Stewart (1997) affirms that for the companies it is relatively easy to measure some external capital indicators such as market share, customer loyalty, customer profitability due to the annual report structure and Bukh (2003) develops a theoretical reason that can justify the company emphasis on external capital. He affirms that IC information should be insert and disclosure in the framework of the firm's strategy for value creation through which it could be possible to understand who the customers are, what they need and how value is created for them in order to obtain a company competitive advantage. This explanation is criticised by Abeysekera (2006, 2008) which affirms that the company should disclosure more information on other dimensions of IC, such as for example human and social capital, with a broader view of the value creation rather than the economic value creation process. On the other hand, there are some opportunity costs that can justify the overall low level of the voluntary ICD made by the companies. Firms could decide to disclosure low level of intellectual capital information through the annual report for protect the strategic importance of IC information (Depoers, 2000; Vergauwen & Alem, 2005) and communicate IC thorough different type of communication channels, such as presentations to financial analyst (Garcia Meca *et al.*, 2005) and investors face to face meeting investors (Holland, 2003; Holland, 2004; Unerman *et al.,* 2007). Relative to the use of annual report as the main source to analyze ICD in a recent study Striukova *et al.* (2008) affirm that "*...a range of corporate reports in addition to annual report were used to communicate information about IC...the pattern of ICDs in the annual report cannot be taken as a proxy for the overall pattern of corporate ICDs*". The study highlights the different type of communication channels used by the companies to disclosure IC information and it stresses the importance of analysing ICD in a broad range of corporate reports in future IC reporting studies.

Our study analyzes ICD in a different perspective and within different corporate report if compared to previous studies. It focuses on social and sustainability reports which have been poorly investigated in the literature (Lev & Zambon, 2003). This study develops a longitudinal analysis of the ICD over a period of two years and classifies ICD following the Beattie *et al*. (2004, 2002) framework which permits to analyze the data in a number of different ways and to asses the quality of ICD disclosure made by companies in their social and sustainability reports.

2. Research Methodology

Sample selection

The sample of corporate documentation used to test the research question is composed by social and sustainability reports for the years 2005 and 2006 of a sample of Italian listed companies on Stock Exchange. The focus has been put on the quoted companies because in accounting literature it is widely demonstrated that the bigger is the company, the greater is the voluntary disclosure (Ahmed & Courtis, 1999; Belkaoui & Karpik, 1989; Boesso & Kumar, 2007) therefore listed companies have been chosen following all the previous research investigating ICD. Moreover this choice allows a more general comparative analysis of this study with the others. A previous research made by Italian Association of Financial

Analyst (AIAF) on CSR reports in Italian listed companies has been considered to identify and check the sample of Italian companies. AIAF's research has allowed us to identify a sample of 37 companies through a judgmental sampling; this was considered the best technique to use due the little amount of social and sustainability report published by the Italian listed company (approx. 13%, AIAF; 2007). Along the two-years analysis 74 social and sustainability reports were identified and analysed.

Content analysis methodology
Several studies used the content analysis to examine company disclosure. It has been used in social and environmental studies (Deegan *et al.*, 2002; Guthrie & Parker, 1989; Gray *et al.*, 1995), in accounting studies (Jones & Shoemaker, 1994; Smith & Taffler, 2000, Linsley & Shrives, 2006) and in the area of ICD (Abeysekera & Guthrie, 2005; Brennan, 2001; Cerbioni & Parbonetti, 2007; Guthrie & Petty, 2000). Content analysis is defined by Krippendorf (2004) as "*a research technique for making replicable and valid inferences from data to their context*". It permits to classify quantitative and qualitative information into well-specified grid of categories to understand company disclosure behaviour with regard to a specific theme. Guthrie & Parker (1990) pointed out that content analysis permits to analyse company published information systematically, objectively and reliably even if the success of the process depends on the reliability and validity of the procedures employed (Beattie & Thompson, 2007; Deegan *et al.*, 2002; Gray *et al.*, 1995).

Recently the use of content analysis in the ICD studies has been criticized for its lack of transparency in providing the necessary information to enable other researchers to understand how the content analysis has been conducted (Abeysekera, 2006; Beattie & Thompson, 2007; Steenkamp, 2007). The present study applies Weber's (1985) scheme to develop a reliable content analysis process.

As a first step the recording units have been defined. Many of the previous studies have chosen the sentence as a recording unit (Bozzolan *et al.,* 2003; Cerbioni & Parbonetti, 2007; Deegan *et al.*, 2002) because, as Milne & Adler (1999, p 243) pointed out, by "*using sentences for both coding and measurement seems likely, therefore, to provide, complete, reliable and meaningful data for further analysis*". In agreement with Milne & Adler's (1999) observation we use sentence as a recording unit of the study. Moreover Unerman (2000) points out that if the content analysis study does not take into account graphics, charts or photographs it probably shows an incomplete representation of the document analysed. Therefore we decided to choose also graphics, charts and table, but not the photographs as recording units. The photographs have not been taken as a recording unit because their analysis is considered too subjective to measure (Guthrie *et al.*, 2004).

As a second step IC categories and elements were defined. According to Beattie & Thomson (2007) there are no general theoretical guidelines to define the boundaries between each category and to classify a specific (intangible) element into a category and as a matter of fact the literature proposes a different framework to identify and classify IC (Guthrie & Petty, 2000; Bukh *et al.*, 2005). Differently from the majority of the previous studies this IC framework in this research is composed of three different levels (*main categories of IC, intangibles elements and intangibles attributes*) in order to ensure a better completeness and validity of the analysis. The categories used for the analysis followed the classification scheme for intangibles derived from Sveiby's (1997) intellectual capital framework: human capital (employee competence), organisational capital (internal structures) and relational capital (external structures). Sveiby's framework has been widely applied in previous ICD studies and its application permits a more general comparative analysis of this study with others. The choice of intangibles elements was based on ICD literature analysis (Abeysenkera & Guthrie, 2005; Beattie & Thompson, 2007; Bozzolan *et al.,* 2003, Sveiby,

1997) and 17 items were defined: four regarding human capital, five regarding organizational capital and eight regarding relational capital. Compared to previous studies some elements were eliminated (different objectives, channel investigated and country) so the total number is lower and defined in a wider way. Subsequently a more accurate definition of the intangibles attribute for each of the 17 elements identified was made through inspection of IC literature that used more detailed and specific IC framework (Abeysenkera & Guthrie, 2005; Bukh et al., 2005, Garcia Meca & Martinez, 2007) and corporate voluntary disclosure (Boesso & Kumar, 2007). The definitions of the intangibles attributes permit to identify exactly the kind of information to be searched into the document and therefore to partially reduce the subjectivity of the research method. In total 68 intangible attributes were identified.

As a third point a check of IC framework was made. Four researchers have conducted the research and in particular two researches have defined the IC framework and two researches have made independently the content analysis. A sample of 5 social and sustainability reports has been checked by two researchers. During the first two rounds of checks some ambiguities in the identification of intangibles elements and intangibles attributes were identified by the two testers, so that the coding framework was updated in agreement between the four researchers. The up-dated framework was assessed by a new check by the same two authors on the same samples after three weeks. After this third check a reliability assessment of IC framework was done using Krippendorff's alpha that showed an acceptable reliability value of 0.82 (Milne & Adler, 1999). Then the rest of the sample of social and sustainability reports was divided between two researches which have made the content analysis[2]. At the end of the analysis the results were checked independently by the other two researchers.

Features of the report analyzed
Not all the parts of social and sustainability reports were analyzed. In particular the corporate governance section and the environmental section were excluded. The corporate governance section was excluded because it contains some mandatory information that all the listed companies have to communicate every year to the financial market. Moreover specific studies have analyzed the relationship between company corporate governance structure and ICD (Cerbioni & Parbonetti, 2007; Li et al., 2008). The environmental section was excluded because it was considered outside the research scope (Cormier et al., 2005; Jose & Lee, 2007; O'Donovan, 2002).

Identifying and quantifying ICD
According to Cerbioni & Parbonetti (2007) most of the previous research on voluntary disclosure in the annual report can be considered mono dimensional because they indicate only the presence/absence of a disclosure on a given topic. Differently in the analysis of ICD three different streams can be observed : (1) a mono-dimensional analysis (April et al., 2003; Brennan, 2001; Goh & Lim, 2004), (2) a building of the disclosure index that could determine the amount of disclosure and consider it as proxies of the disclosure quality (Bozzolan et al., 2003; Bukh et al., 2005; White et al., 2007; Garcia Meca & Martinez, 2005), (3) and a more recent approach that analyse frequency and quality of ICD because consider the disclosure as a multidimensional and complex concept (Cerbioni & Parbonetti, 2007). This latter approach entail the practice of counting instances of disclosure and the calculation of a multidimensional quality index.

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[2] See appendix A for a definition of Intellectua Capital. See Appendix B for an in depth explanation of the rules appled to content analysis and Appendix C for an accurate presentation of typologies and frequencies of intangible attributes.

This paper analyses the frequency and the quality of ICD applying the framework developed by Beattie *et al.* (2002; 2004; hereafter BMF). According to BMF' framework the disclosure quality depends on disclosure frequency and on how disclosure is spread among the different topics of the framework. The authors claim that high quality disclosure is linked to a widespread and balanced disclosure among different topics and subtopics of the adopted framework. In BMF' framework three other aspects are considered important to appreciate the characteristics of disclosure: the time dimension (historical, forward-looking and non-time specific information), the financial dimension (financial versus non-financial information) and the type of measured dimension (quantitative versus qualitative information). As underlined by Beretta & Bozzolan (2008) this framework therefore offers a complete and richer descriptive profile of the firm's narrative disclosures compared to the count of disclosed items[3].

In order to measure the disclosure quality, Beattie *et al.* (2004) employed four measures. First of all the frequency of disclosure is measured by using the relative amount of disclosure on IC adjusted for size and complexity used as independent variables. BMF framework suggest that the standardised residuals of an OLS regression of the two independent variables can be used as a good *proxy* of disclosure frequency. Corporate size (measured with the log of companies market capitalization at the end of each year) has been found to be significantly and positively associated with social and voluntary disclosure, suggesting that larger companies follow higher disclosures (Ahmed & Courtis 1999; Boesso & Kumar, 2007; Garcia Meca *et al.*, 2005; Li *et al.,* 2008; Meek *et al.*, 1995). Moreover size has been used as a proxy of the complexity of a company (Beretta & Bozzolan, 2008; Cooke & Wallace, 1989; Cooke, 1992). Hackston & Milne (1996) pointed out that larger companies undertake more activities, have a greater impact on society and have more stakeholders who might be concerned with the activities undertaken by the company itself. Considering the second independent variable after size, according with Beretta and Bozzolan (2008) we used industry instead of complexity. Industry (coded as dummy variable) is a significant factor in driving voluntary company disclosure (Buck *et al.,* 2005; Hackston and Milne, 1986; Li *et al.,* 2008; Roberts, 1992). Buck *et al.* (2005) demonstrate that high-tech companies disclose information almost twice than low-tech companies Also Garcia Meca & Martinez (2007) found that the focus on intangibles is higher in communication and new technology industries and lower in petrochemical and metal working industries. Li *et al.*, (2008) show that companies in the food and beverage sector put greater focus on ICD mainly due to great emphasis on brand disclosure. Finally Striukova *et al.* (2008) found a significant sector effects on ICD for UK companies, showing that retail sector and pharmaceutical/biotech sector had the most ICD level. In this vein we calculated Standardized Residuals of a regression where the number of text units was the dependent variable and size and sector were the independent ones.

The relative amount of disclosure is only one quality dimension. Another dimension is the spread of disclosures across topics (i.e. human capital, organizational capital and relational capital) and sub-topics (i.e. the 17 intangibles elements) this dimension is measured by three indexes: (1) a disclosure concentration index among the elements of the framework (Herfindahl index on main topics); (2) a concentration index of the disclosure among the sub-topics of the framework (Herfindahl index on sub-topics); (3) the number of non-empty sub-topics. Each of the four indexes is a proxy of one dimension of disclosure quality and the

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[3] The design and direction of several empirical studies were influenced by BMF' framework: Beretta & Bozzolan (2005; 2008), Cerbioni & Parbonetti (2007), Hussainey, Schleicher & Walker (2003)

mean of them determines the quality of disclosure for each company analyzed[4]. The methodology allowed to built an ICD index for each companies in each year.

Finally this study doesn't take into account the amount of space (proportion of an A4 page) in the report devoted to a particular issue because the aim of the research is to analyze the frequency and the quality of ICD in social and sustainability reports and not to calculate how much space is devoted to IC in these kind of reports. Moreover social and sustainability reports are voluntary documents and the company can choose freely the length of the reports. Differently from the annual report in the voluntary reports there isn't the need to weight carefully how much space is allocated to each specific issue but, on the contrary, there is the opportunity to communicate different type of information (Striukowa *et al.*, 2008).

3. Results of ICD analysis

This section provides and discusses the results of ICD analysis. It stars with a longitudinal analysis of ICD, followed by an analysis of the disclosure by type and finally it concludes with the analysis of quality disclosure index.

Longitudinal intellectual capital disclosure

Table 2 indicates the results of the research in terms of descriptive statistics of text units. It shows that intangibles information are well reported by the social and sustainability reports. The results of the 2-year study indicate that companies reported an overall increase in all categories of intellectual capital. In 2005 the most reported category was relational capital which increased over the two years with a rate of 4.3%. The human capital was the second most reported category and it increases with a rate of 6.4%. The last reported was organizational capital which evidence the best increase over the two year with a rate of 15%. In 2005 and 2006 "customer" was the most reported element in the relational capital category, followed by "community relations" for year 2005 and by "distribution channels" for the year 2006. The less reported was for the year 2005 "relationship with university & research centre collaboration" and for 2006 "business collaboration". In 2005 the most reported intangibles attributes has been "social and ethical activities" followed by "customer satisfaction", "meeting with financial stakeholder" and "description & typology of distribution channels". In 2006 the reported level of intangibles attributes is changed; despite that "social and ethical activities" continues to be the most reported intangibles attribute then it was follow by "typology and number of customers", "annual sales per segment or product" and finally by "number and geographic diversification of distribution channels".

In the category of human capital for 2005 and 2006 "employee relations" was the most reported intangible element followed by "employee training" while the less reported has been "employee skills". In terms of intangibles attributes the most reported were the "description of training programs and activities" and "staff health and safety" for both the years followed by "employee agreements" and "staff breakdown by gender" for 2005 and by "rate of staff turnover" and "employee agreements" for 2006.

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[4] See Beattie *et al.* (2002, 2004) and Beretta & Bozzolan (2008) for a more complete explanation of the original index. Section three will deeper analyse the index construction.

Table 2 – Descriptive Statistics for text units

	Total Frequency		Mean		Median		Std. Dev.		Min.		Max.	
	2005	*2006*	*2005*	*2006*	*2005*	*2006*	*2005*	*2006*	*2005*	*2006*	*2005*	*2006*
Employees characteristics	289	358	7.8	9.7	6	9	4.78	4.92	2	2	21	21
Employees training	489	475	13.2	12.8	11	11	7.51	7.32	1	2	31	34
Employees skills	92	74	2.5	2.0	2	2	1.41	1.43	0	0	6	7
Employees relations	697	761	18.8	20.6	18	19	8.59	10.29	4	4	36	46
Human capital	*1,567*	*1,668*	*42.3*	*45.1*								
Intellectual property	175	98	4.7	2.7	1	0	6.87	6.15	0	0	30	29
Information systems	107	72	2.9	2.0	2	1	2.88	2.00	0	0	9	7
Corporate culture and management philosophy	273	360	7.4	9.7	6	7	5.31	7.12	0	0	19	26
Management processes	289	455	7.8	12.3	6	8	6.44	1.11	0	3	29	48
R & D activity	130	135	3.5	3.7	1	0	4.83	5.84	0	0	16	22
Organizational capital	*974*	*1,120*	*26.3*	*30.3*								
Distribution channels	243	268	6.6	7.2	4	5	7.09	9.23	0	0	27	46
Business collaborations	94	59	2.5	1.6	1	0	3.59	3.05	0	0	13	14
University and Research Center collaboration	87	73	2.4	2.0	1	0	2.72	3.10	0	0	9	15
Brands imagine	141	155	3.8	4.2	3	3	4.18	4.37	0	0	21	20
Customers	561	682	15.1	18.4	14	18	10.65	10.79	0	2	54	47
Suppliers	215	212	5.8	5.7	5	5	4.87	4.84	0	0	21	19
Financial relations	195	174	5.3	4.7	5	4	3.06	3.42	0	0	12	12
Community relations	249	239	6.7	6.5	7	6	2.34	2.66	0	2	12	13
Relational Capital	*1,785*	*1,862*	*48.2*	*50.3*								
	4,326	**4,650**	116.9	125.7								

In the organizational capital the category "corporate culture and management philosophy" was the most reported for 2005 followed by "management processes", in 2006 instead the two intangibles elements exchanged their position and finally the last reported was "information system" for both the years. The attributes most reported were "corporate culture statements" for both the year followed by "patents, copyrights and trademarks" in 2005 and by "company strategy description" and "performance measurement systems" in 2006.

This analysis evidences that the ICD change over the two years in particular at both intangibles and attributes level. This change could be cause by the different activities made by the company like more investments in the area of process management (in particular for the performance measurement systems) and in the area of health and safety and, by a different strategy communication companies process that can cause a more (less) disclosure on some specific intangibles and attributes. Over the year information on company strategy, customer characteristics, employee turnover, supplier policies and distribution channels, etc. tend to increase and other like description of IT facilities, staff breakdown by education, typology and number of university and research center collaboration tend to decreasing.

The mean value of ICD is high compared with the majority of the most recent annual report studies (table 3).

Table 3 – Comparison of ICD mean value of recent studies

	This study 2005 2006		Bozzolan et al. (2003) IT(is) IT(nis)		Guthrie et al. (2006) AUS HK		Steenkamp (2007) NZ	Oliveira et al. (2006) PT	Sonnier et al. (2008) USA	Vandemaele et al. (2005) NL SW UK		
Country	IT		IT(is)	IT(nis)	AUS	HK	NZ	PT	USA	NL	SW	UK
Document analysed	Social and Sustainability Report		Annual Report		Annual Report		Annual Report	Annual Report	Annual Report	Annual Report		
ICD category												
Human capital	42.3	45.1	17	7	3.3	4.6	25.2	26.6	9.2	45	61	35
Organizational capital	26.3	30.3	27	9	13	3.7	7.7	30.1	0.7	44	50	34
Relational capital	48.2	50.3	40	17	15.3	4.9	11.9	33.3	17.8	66	66	52
Total	*116.9*	*125.7*	*84*	*34*	*31.6*	*13.2*	*44.7*	*90*	*27.7*	*155*	*177*	*121*

The ICD mean value of this study is respectively 116.9 intangible for 2005 and 125.7 intangibles for 2006. In a previous analysis of Italian companies Bozzolan *et al.* (2003) show a IC mean value of 84 elements for the companies operating in IC intensity sectors and a mean value of 34 for the companies operating in non IC intensity sectors. Also Guthrie *et al.* (2006) show an ICD mean value for Australian and Hong Kong companies very low compared to the results of the present study. The Australian companies tend to disclosure on average 31.6 intangibles while Hong Kong companies only 13.2 intangibles elements. This result is confirmed also for the New Zealand companies which communicate on average 44.7 intangibles items[5] (Steenkamp, 2007), for Portuguese companies which communicate 90 intangibles elements each one (Oliveira *et al.*, 2006) and for USA companies that had a mean disclosure of intellectual capital of 27.7 in 2004 (Sonnier *et al.*, 2008). Different results instead are showed by Vandemaele *et al.* (2005) which found that Netherlands, Sweden and

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[5] Only the frequency texts have been taken into account to calculate the mean value (see Stenkaamp, 2007, pag. 201).

the UK companies disclosure a high level of IC in their annual report which is respectively 155, 178 and 122 intangibles elements communicated in 2002.

Such comparison once more support the idea of Striukova *et al.* (2008) that the annual report cannot be taken as proxy for the overall pattern of corporate ICDs.

Intellectual capital disclosures by type

One way analysis
One way analysis (table 4) shows that ICD is communicated principally in non financial, quantitative and non time specific terms. In time dimension area the majority (on average 77. 3 %) of disclosures are non time specific i.e. reported to the year of the report. There is a quite good level of historical information (on average 19.93%) but only a few highlights the communication of forward looking information (on average 2.75%). Overall there is an increasing trend over the years in all the three sub-areas in particular for forward looking information. In financial/non financial area the non financial information are the most reported (on average 87.37) and it evidences a heavily unbalanced disclosure between this two categories. As in the previous area there is a positive trend over the years. In quantitative/non quantitative area the disclosure can be considered more balanced between the two areas (on average respectively 59.8% and 40.17%) with a particular attention towards the communication of quantitative information which register an increasing of 1.16% over the two years while non quantitative information showed a little decrease (-0.04%).

Two way analysis: time x financial/non financial
The most common mix is NTS/NF which accounts for 69.6 % in 2005 and for 69.1% in 2006 which evidences a very high unbalanced level of disclosure inside the area It is interesting to note that overall the forward looking information are communicated essentially in non financial terms. Moreover the historical information are more reported in financial terms (on average 24%) compared to the forward looking information (on average 5.3%). Over the years only mix NTS/F registered a decreasing level of disclosure.

Two way analysis: time x quantitative/non quantitative
In this area the overall level of disclosure is better spread between the various mix. In 2005 the mix most reported is NTS/NQ while in 2006 NTS/Q. Also in this area the forward looking information are less reported in quantitative terms compared to quantitative historical information (on average 26% vs. 96%). Over the years five mix NTS/NQ registered a increasing level of disclosure.

Two way analysis: financial/non financial x quantitative/non quantitative
In this area the disclosure is concentrated essentially in two combinations which are non financial/quantitative (on average 47.2%) and non financial/non quantitative (on average 40.2%). The combination financial/quantitative show overall a level of disclosure of 12.6% while mix F/NQ in practice doesn't report anyone items. Over the years two mix NF/Q and F/Q registered an increasing level of disclosure.

Table 4 – Distribution of ICD per type and year

		2005	2006	Total	% Var. 05/06
One way analysis	*Time dimension*				
	Historical	833	956	1,789	1.15
	Forward-looking	107	140	247	1.31
	Non-time specific	3,386	3,554	6,940	1.05
	Financial/non-financial				
	Financial	550	584	1,134	1.06
	Non-financial	3,776	4,066	7,842	1.08
	Quantitative/non-quantitative				
	Quantitative	2,486	2,884	5,370	1.16
	Non quantitative	1,840	1,766	3,606	-0.04
Two way analysis	*Time X financial non financial*				
	Historical/financial	194	234	428	1.21
	Historical/Non financial	639	722	1,361	1.13
	Forward-looking/financial	4	9	13	2.25
	Forward-looking/non financial	103	131	234	1.27
	Non time specific/financial	352	341	693	-0.03
	Non time specific/non financial	3,034	3,213	6,247	1.06
	Time X quantitative/non quantitative				
	Historical/quantitative	778	942	1,720	1.21
	Historical/non-quantitative	55	14	69	0.25
	Forward looking/quantitative	18	46	64	2.56
	Forward looking/ non quantitative	89	94	183	1.06
	Non time specific/quantitative	1,690	1,896	3,586	1.12
	Non time specific/non quantitative	1,696	1,658	3,354	-0.02
	Financial/non-financial x quantitative/non quantitative				
	Financial/quantitative	550	583	1,133	1.06
	Financial/non quantitative	-	1	1	100.00
	Non financial/quantitative	1,936	2,301	4,237	1.19
	Non financial/non-quantitative	1,840	1,765	3,605	-0.04
Three way analysis	Historical/financial/quantified	194	234	428	1.21
	Historical/financial/non-quantified	-	-	-	0.00
	Historical/non financial/quantified	584	708	1,292	1.21
	Historical/non financial/non quantified	55	14	69	0.25
	Forward looking/financial/quantified	4	9	13	2.25
	Forward looking/financial/non quantified	-	-	-	0.00
	Forward looking/non financial/quantifies	14	37	51	2.64
	Forward looking/non financial/non quantified	89	94	183	1.06
	Non time specific/financial/quantified	352	340	692	-0.03
	Non time specific/financial/non quantified	-	1	1	100.00
	Non time specific/non financial/quantified	1,338	1,556	2,894	1.16
	Non time specific/non financial/non quantified	1,696	1,657	3,353	-0.02

Three way analysis
The majority of the disclosure is reported in two combinations: non time specific/non financial/quantified (on average 32.4%) and non time specific/non financial/non quantified (on average 37.6%). Moreover mix H/NF/Q shows a good level of disclosure (on average 14.4%) while the remaining combinations stay under the level of 8%. Also in this area there is a good trend of increasing over the years.

Interaction between elements and type
Powerful insight emerge from linking the elements and type analysis together (table 5). Relational capital disclosures over the years are predominately non time specific (77.8%), quantitative (68.5%) and non financial (83.2%). In three ways analysis the predominant category is NTS/NF/Q (37.3%) followed by NTS/NF/NQ (30.4%). Historical quantified information plus non times specific quantified information represent together the 68% of their segment of disclosures. Finally the level of forward looking disclosure is extremely low (1.2%) and the level of financial quantified information (16.8%) is the most higher of three IC categories. In the intangibles elements "customers", the most reported category is NTS/NF/Q (53.4%) followed by H/NF/Q (22.5%). Also "distribution channels" are communicated essentially in terms historical or non times specific/quantitative/non financial (62.8%) moreover this intangibles element registers a good level of financial quantify information (20.5%) .

Human capital disclosures is communicated over time essentially in non time specific (74%), quantitative (71.5%) and non financial (89.7%) terms. In three ways analysis the higher category is NTS/NF/Q (40%) followed by NTS/NF/NQ (28.6%). As in the relational capital category historical quantified information plus non times specific quantified information represent the majority of their segment of disclosure (69.6%). Moreover the level of forward looking disclosure is extremely low (1.3%) and the level of historical information (24.7%) is the higher between the three IC categories. The intangibles show that "employee relations" are expressed in NTS/NF/NQ (35%) term and then in NTS/NF/Q (31.5%) while for "employee trainings" the preferred combination of disclosure is NTS/NF/Q with 38.9%.

Organizational capital category shows overall a low level of quantify disclosure (26.6%) due to the high level of "company culture" and "management philosophy" non quantify disclosures (29.6%). It is predominantly communicate in non time specific (81.7%), non quantified (73.4%) and non financial (90.1%) terms. Most disclosures are NTS/NF/NQ (64.8%) followed by NTS/NF/Q (11%) which is relatively high because in 2006 there was a great attention by the companies to communicate more quantified "business processes information". Forward looking organizational capital information are the most reported (7.6%) compared with FL information of relational and human capital categories.

Table 5 – Analysis of ICD 2005/2006 by elements/type interaction

CODE	Human Capital	Year	H/NF/NQ	NTS/NF/NQ	FL/NF/NQ	H/F/NQ	NTS/F/NQ	FL/F/NQ	H/NF/Q	NTS/NF/Q	FL/NF/Q	H/F/Q	NTS/F/Q	FL/F/Q
AA	Employees characteristics	2006	1	10	0	0	0	0	111	221	5	5	5	0
		2005	0	5	0	0	0	0	94	176	2	6	6	0
AB	Employees training	2006	0	147	2	0	0	0	76	193	3	20	33	1
		2005	3	168	6	0	0	0	73	181	2	20	35	1
AC	Employees skills	2006	0	23	1	0	0	0	17	33	0	0	0	0
		2005	0	25	2	0	0	0	21	42	2	0	0	0
AD	Employees relations	2006	0	242	0	0	0	0	145	262	4	43	65	0
		2005	6	268	12	0	0	0	122	197	0	35	57	0
	Organizational Capital		H/NF/NQ	NTS/NF/NQ	FL/NF/NQ	H/F/NQ	NTS/F/NQ	FL/F/NQ	H/NF/Q	NTS/NF/Q	FL/NF/Q	H/F/Q	NTS/F/Q	FL/F/Q
BA	Intellectual Property	2006	0	47	0	0	0	0	0	3	0	15	33	0
		2005	2	100	0	0	0	0	3	7	0	14	49	0
BB	Information and netwoking systems	2006	0	48	3	0	0	0	4	7	0	4	5	1
		2005	5	83	7	0	0	0	3	5	0	1	2	1
BC	Company culture and management philosophy	2006	0	275	74	0	0	0	0	4	5	0	0	2
		2005	1	246	25	0	0	0	0	1	0	0	0	0
BD	Processes Management	2006	6	213	10	0	0	0	73	127	10	7	8	1
		2005	29	152	16	0	0	0	33	48	2	4	5	0
BE	Research and development	2006	0	98	0	0	0	0	3	15	0	7	12	0
		2005	0	96	0	0	0	0	3	12	1	7	10	1
	Relational Capital		H/NF/NQ	NTS/NF/NQ	FL/NF/NQ	H/F/NQ	NTS/F/NQ	FL/F/NQ	H/NF/Q	NTS/NF/Q	FL/NF/Q	H/F/Q	NTS/F/Q	FL/F/Q
CA	Distribution channels	2006	0	36	1	0	0	0	41	133	2	18	35	2
		2005	1	36	3	0	0	0	35	112	3	20	32	1
CB	Business collaborations	2006	5	51	0	0	0	0	0	1	0	0	2	0
		2005	1	78	0	0	0	0	1	6	0	0	8	0
CC	University and Research Center collaboration	2006	0	63	0	0	0	0	2	6	0	0	2	0
		2005	0	78	1	0	0	0	1	2	0	0	5	0
CD	Company reputation	2006	2	78	0	0	0	0	23	50	1	1	0	0
		2005	1	45	0	0	0	0	19	76	0	0	0	0
CE	Customers	2006	0	91	0	0	1	0	155	362	1	26	44	2
		2005	3	74	8	0	0	0	125	302	2	17	30	0
CF	Suppliers	2006	0	61	3	0	0	0	40	86	0	8	14	0
		2005	2	55	2	0	0	0	32	93	0	12	19	0
CG	Financial relationship	2006	0	15	0	0	0	0	18	53	2	41	45	0
		2005	0	22	1	0	0	0	19	76	0	33	44	0
CH	Community relationship	2006	0	158	0	0	0	0	0	1	4	39	37	0
		2005	0	167	6	0	0	0	0	1	0	25	50	0

Quality index analysis

Beattie *et al.* (2004) identified a disclosure quality index (Q) as mainly coming from two dimensions: the relative amount of disclosure and the spread of text units.

Standardized Residuals (StdRes) represent the relative amount of disclosure. Such dimension expresses the distance between the actual and the expected amount of disclosure. The former derives directly from the value observed in the content analysis, whereas the latter is defined by the regression of the number of text units on company size and sector[6]. The idea beneath is that the larger the standardized residual, the greater the relative amount of disclosure.

The spread of text units is measured by three dimensions. The first two attain the Herfindahl index, which is a concentration measure, calculated on the main topic level (MainH) and sub-topic level (SubH). The higher the H index, the lower the spread. The third dimension consist in the count of non-empty sub-topics (NonEmp). The higher the measure, the higher the spread. Summing up, Standardized residuals and Non empty sub-topic measures positive relate with disclosure quality. It means that higher level of the measures will be associated with higher level of quality disclosure. The opposite should be true for H main topic and H sub-topic.

The following table 6 presents the Pearson correlations between these four measures both for 2005 and 2006. The sign of the correlations results as expected. MainH and SubH are positive correlated each other, the same could be said for StdRes and NonEmp; whereas the formers (Main H and SubH) are negative correlated both with StdRes and NonEmp. Only in 2006 two correlations are not statistically significant (MainH-StdRes and MainH-NonEmp) but present the predicted sign. As confirmed by Beattie *et al.* (2004) this shows that the measures have construct validity.

Table 6 – Pearson correlation coefficients of the four measures of Q

2005	StdRes	MainH	SubH	NonEmp
StdRes	1			
MainH	-0.305 (0.07)*	1		
SubH	-0.608 (0.00)***	0.538 (0.00)***	1	
NonEmp	0.618 (0.00)***	-0.404 (0.01)**	-0.735 (0.00)***	1

2006	StdRes	MainH	SubH	NonEmp
StdRes	1			
MainH	-0.144 (0.39)	1		
SubH	-0.498 (0.00)***	0.333 (0.04)**	1	
NonEmp	0.518 (0.00)***	-0.231 (0.17)	-0.566 (0.00)***	1

* p<0.10; ** p<0.05; *** p<0.01; *StdRes* = Standardized Residuals from the regression of text units on company size and sector; *MainH* = Herfindahl index for main topics; *SubH* = Herfindahl index for sub-topics; *NonEmp* = number of non empty sub-topics. p value in parenthesis.

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[6] Beattie *et al.* (2004) considered size and complexity as the independent variables of the regression whereas in this study we consider the sector as a proxy of complexity. Company size was measured using the logarithmical transformation of the capitalization value (Ln). Three sector (Financial, Service and Manufacturing) were defined using the classification of the Italian Stock Exchange (Borsa Italiana). Likewise Beattie *et al*. (2004) the regressions were significant (with an $R^2 = 0.17$ for 2005 and $R^2 = 0.18$ for 2006) but only the size variable was significant at a 5 % level.

In order to design a proxy of the overall quality measure (Q) Beattie *et al.* (2004) combined the four measures[7]. An higher value of Q indicates an higher level of disclosure quality. Given the fact that such measure is referred to each company, and not to the entire sample[8], it becomes interesting to analyse the change of the disclosure level in comparing the Q values along the two years. As reported in table 7, out 15 of the 37 companies of the sample increase the Q value, 15 decrease it and 7 substantially maintain the same disclosure quality level. However in 2005 19 companies had a quality index level higher compared to the mean value while in 2006 the companies were 23. In general terms we could state that the overall quality level of the entire sample is almost the same in the two years. It is very hazardous to express a judgment about the overall Q change of the sample because such measure is useful in ranking the companies according to their degree of disclosure quality. Remember that Q is calculated as a mean of four standardized measures, and at the moment it makes difficult to express an opinion on the overall disclosure quality of two years, even of the same sample.

Table 7 – Q values of the companies in 2005 and 2006

Company Nr.	Q.2005	Q.2006	Delta Q	Company Nr.	Q.2005	Q.2006	Delta Q
1	0.67	0.98	0.31	20	1.57	1.68	0.11
2	0.75	0.52	-0.23	21	0.36	0.02	-0.34
3	0.93	1.29	0.36	22	0.42	0.69	0.27
4	-1.82	-1.25	0.57	23	1.30	1.10	-0.20
5	1.40	0.88	-0.52	24	0.25	1.04	0.79
6	0.02	-0.09	-0.11	25	0.21	0.16	-0.05
7	-0.49	0.12	0.61	26	0.53	-0.06	-0.59
8	0.59	0.71	0.12	27	1.69	0.87	-0.82
9	1.04	0.94	-0.10	28	0.96	0.81	-0.15
10	0.71	0.18	-0.53	29	0.26	0.09	-0.17
11	-0.12	-0.2	-0.08	30	-0.63	-0.46	0.17
12	0.76	0.67	-0.09	31	0.97	1.24	0.27
13	0.21	-1.3	-1.51	32	1.37	1.14	-0.23
14	-1.48	-0.47	1.01	33	0.18	0.83	0.65
15	1.26	0.80	-0.46	34	1.14	1.22	0.08
16	-0.12	0.12	0.24	35	-0.57	1.28	1.85
17	0.47	0.52	0.05	36	0.93	-0.77	-1.70
18	1.18	1.09	-0.09	37	0.02	0.69	0.67
19	1.57	1.40	-0.17				

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[7] MainH, SubH and NonEmp were first standardized; then, to maintain comparability of interpretation, the H indices have been reversed (Beattie *et al.*, 2004). Q value is then calculated as follows: Qc = $\sum_{i=1}^{4} \frac{q_i}{4}$.

[8] The mean of Q at the sample level is always 0.5.

4. Discussion and conclusions

This in depth ICD analysis confirms and expands the study of Cordazzo (2005) which found a good level of IC information inside CSR reports and contrast with the result of Striukova *et al.* (2008) which shows that UK companies report only the 1% of their overall IC information through CSR reports. This difference could be explained through a different relationship between the companies and the stakeholder (van der Laan Smith et al. 2005) by different culture mechanism that influence the companies behaviour (Hannifa & Cooke, 2005) and by several internal organizational factors (Adams, 2002).

It is interesting to note that IC information is communicated mainly in quantitative terms either financial (12.6%) or non financial (47.2%). This result is completely different from previous studies on company reports which show a tendency of the companies to communicate predominantly discursive information. Guthrie *et al.* (2007) found that "*nearly 90% of IC information disclosed is expressed in discursive rather than numerical terms*", Striukova *et al.* (2008) show that on average the 80% of the disclosure is expressed in narrative and discursive form. Also Oliveira *et al.* (2006) show that Portuguese companies disclosure the 81.1% of their information in qualitative and this tendency is confirmed also by Sujan & Abeysekera (2007) which show as the 73 % of IC information is reported in qualitative terms. Only the study of Hyon Ju Kang (2006) shows that the majority (on average 65%) of a sample of 170 international companies operating in the top emerging financial market reported IC voluntary disclosure in quantitative terms and in monetary values (on average 32.7% of the companies). Also previous studies focussed more broadly on disclosure than IC show that companies tend to communicate prevalently non quantitative information. Beattie *et al.* (2004) found that 78% of disclosure in their study was non quantitative and Boesso & Kumar (2007) show that the qualitative information is 58.2%.

The high rate of quantitative information and their increasing over the years highlight that companies put increasing attention to the quantitative measurement of their IC especially for relational and human capital. Moreover it is acknowledged that there are constraints in quantifying some IC attributes, which in many instances have only qualitative form such as corporate culture and management philosophy. This last aspect therefore confirms the high results showed by the companies in their IC measurement processes. The presence of high rate of quantitative information can induce to think that a part of this information is taken into account by the companies in their decision making processes.

In terms of time orientation the results show an extremely low level of forward looking information. Due to the impossibility to compare this results with similar research in IC field the comparison will be made with previous studies focussed on forward looking disclosure more broadly than IC. The results of this study compared with others show a lower level of IC forward looking information. In this study the sample of companies reported on average over the years 3.3 (2.8%) forward looking information each one. Robb *et al.* (2001) find that USA, Canadian and Australian companies disclosure on average 58.5 non-financial forward looking information in their annual report. Beattie *et al.* (2002) show that UK companies reported on average the 14% of the disclosures in forward looking terms in their annual report while USA companies instead reported the 8% of their disclosure in forward looking form. (Grant *et al.* 2000). Also Clarkson (1999) shows a higher level of forward looking information (on average 5.6) in management and discussion analysis (MD&A) for a sample of 300 firms in 1992 and 1993. Finally Beretta &

Bozzolan (2008) find that Italian listed companies on average reported 75.08 forward looking information in their annual report.

This analysis shows a low tendency of the companies to communicate IC forward looking information probably because they don't want to reveal to competitors their future IC management and development strategies.

To conclude the high and variegated presence of intangible information in social and sustainability reports can be explained by different perspectives. Gray *et al.*, (2001) affirm that employees are the corporate principal target in environmental and community disclosure through which the companies can legitimate their behaviour towards the stakeholder (Campbell, 2000; Deegan, 2002). Other researches instead affirm that there is a link between the corporate social responsibility behaviour of the company and the developments of intangibles assets. Castelo Branco & Lima Rodriguez (2006) and Molteni (2004) affirm that investments in socially responsible activities may create internal and external intangibles benefits. In terms of internal intangibles benefits CSR activities permit to develop employees competence and capabilities through training programs and job rotation opportunities and to create a better work environments. CSR activities can also increase employees' motivation, commitment and loyalty to the firm and therefore reinforce the relation between the company and their employees (Castelo Branco & Lima Rodriguez, 2006). It can also positively impact on company culture and management philosophy because the external intangibles benefits of CSR are related to its effect on corporate reputation which can be view as one of key intangible resource. Moreover company with good social responsibility may establish and improve relations with external stakeholders such as customers, investors, bankers, supplier and to attract better employees i.e. it permits to develop the relational capital dimension (Castelo Branco & Lima Rodriguez 2006; Fombrun *et al.*, 2000). Finally the well combined effects of internal (human capital) and external (relational capital) benefits of CSR permit to increase the organizational capital because the more will the employee knowledge and relational capital be detected or rented by the company the higher the equipment of organizational capital will be owned by the company (Stewart, 1997). The effects of CSR activities may operate positively on company culture and management philosophy improving the attention on employees equal opportunities, on transparency towards the external stakeholder and indirectly may improve company business processes such as quality assessment, environmental and health & safety system and step up the knowledge embedded in information and networking system. According to this prospective the high presence of IC information in the social and sustainability reports can be view as the natural external output of a company strategic management of CSR and intellectual capital.

This study contributes to the analysis of intellectual capital reporting in a broad range of corporate reports. It addresses this aims by analyzing in depth and in a longitudinal way ICD in social and sustainability reports published by a sample of Italian listed companies. This study shows an high and increasing level of ICD reported over the years in these company reports. Moreover results show, in a different way from previous ICD annual report studies, that ICD is communicated predominantly in quantitative terms both financial and non financial. In terms of time orientation IC information is essentially expressed in historical and non time specific way with an extremely low level of forward looking information. Overall results evidence a clear and proactive company behaviour to the quantitative measurement and externally reported of IC information.

Other that the potential limitation inheriting the use of content analysis, such as the problem with the quantification metric used and the intersubjective understanding of the issues among the

researcher, this study shows other limitations. A first limitation is the use of social and sustainability report as source to investigate ICD. A potential lack of reliability may be ascribed to the information contained in these reports (Galli & Baldon, 2005), however a rhetorical and marketing use has been also demonstrated for other company reports such as the annual report (Stanton & Stanton, 2002). A second limitation is the little dimension of sample analyzed which does not permit to generalize the results. The third limitation pertains the analysis of the quality disclosure index (Q). Further analysis is needed to investigate the meaning of quality disclosure index and the relationship between quantity and quality level of disclosure (Beretta & Bozzolan, 2008). Finally it is acknowledged that IC report and social and sustainability reports have different purposes, contents and different strategic perspectives (Mouritsen *et al*, 2003), however the presence of IC information in social and sustainability reports has been showed by this study and it has been also confirmed by the behaviour of some companies which clearly indicate which part of their social/sustainability reports is dedicated to the IC information.

To conclude the contribution of this study is to analyze in depth and in a different corporate reports, compared to the previous studies, intellectual capital disclosure and to show how IC information is reported in a multidimensional ways by the companies. The findings confirm the importance to analyse a broad range of company reports to really understand the IC company communication strategy. At a broad policy level the research can potentially help the regulatory developments both in the area of intellectual capital reporting and in other areas of corporate reporting.

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APPENDIX A
A definition of intellectual capital

Extract from Unerman, J., Guthrie, J., Striukova, L., 2007. UK reporting of Intellectual capital. Institute of Chartered Accountants in England & Wales Research Report, London

Human capital (Employee competence)
This refers to the individual's education, skills, training, values, experiences, and so forth. The non revenue generators are called support staff. As is the case for customers and supplier, these cannot be owned by an organization. However, from a value base perspective they should be measured and placed on the balance sheet, as one cannot envisage an organisation without employee. Employee competence requires the capacity to create both tangible and intangibles assets in a wide variety of situations. In knowledge organisations there is little "machinery" other than the employees.

Organizational capital (Internal structure)
This consists of such items as patents, concepts, models, research and development, and computer and administrative systems. These are usually created by the employees or are brought in. Decisions can be made to invest or replace these intangibles. Organizational culture and spirit is also considered part of the internal structure, as are organizational structure and legal parameters.

Relational capital (External structure)
This consists of relationship with customers and supplier, brand names, trademarks and reputation. Some of these can be considered to be proprietary, but only in a temporal sense and, even then, not with any degree of confidence. For instance, a company has some influence over the value of its customer relationships, however reputation and relationship can change over time and a company cannot control the behaviour of customers or supplier if they are not compliant. The tenuous nature of the supplier-firm-customer nexus complicates the measurement process. Hence, the economic value of this relationship is at the present not determined by any generally accepted definition or measurement system.

APPENDIX B
Content analysis rules

▪ Code for sentences (do not code for word and paragraphs).
▪ Code for graphs, tables and indicators.
▪ Do not code for picture.
▪ Do not code if concept is implied.
▪ Do not recount the same information on intangibles elements or attributes.
▪ If a concept can be insert into two different intangible elements or attributes apply the dominance principle i.e. insert the concept in the area which seems to be more closely linked with the information analyzed.
▪ One sentenced is coded as one frequency
▪ Inside the tables one year is coded as one frequency
▪ One graph is coded as one frequency
▪ One indicators outside the tables is coded as one frequency
▪ Do not analyze corporate governance and environmental sections.

▪ Quantitative information: facts and claims that are represented by numbers.
▪ Qualitative information: facts and claims presented in narrative, not numerical form.
▪ Historical information: facts and events referred to the previous years compared with the year of the report analyzed.
▪ Non-time specific information: facts and events referred of the year of report analyzed.
▪ Forward looking information: fact and events referred of next years compared with the year of the report analyzed.
▪ Financial information: facts and claims that are represented by monetary numbers.
▪ Non financial information: facts and claims presented in not monetary numbers/form such as for instance time, quality, %, quantity.

APPENDIX C
Typology and frequency of intangibles attributes

	TOTAL	
	2005	**2006**
Human Capital		
Employees characteristics		
Staff breakdown by age;	43	46
Staff breakdown by seniority;	28	36
Staff breakdown by gender;	69	67
Staff break down by job fuction	61	63
Rate of staff turnover and comments on change in number of employees	56	98
Efficency employee index	32	48
Employees training		
Number of education programs;	23	5
Description of training programs and activities (hours, tipology, etc.)	409	408
Education and training expenses;	57	62
Employees skills	0	0
Staff breakdown by education	57	45
Competence develepoment program (description, investment)	35	29
Employees relations		
Staff health and safety	186	243
Absence	29	40
Pensions	13	7
Carrer opportunities	34	42
Value added per and to employee	61	64
Insurance polizie	23	15
Recruiment polizie	21	23
Employee agreements (union agreements)	94	74
Employee company social activity	65	69
Employee satisfaction (survey, indices)	37	30
Diversity and equal opportunities	49	58
Employee litigations and legal actions	30	30
Benefits	55	66
Organizational Capital		
Intellectual Property		
patents, copyrights and trademarks (description, number, value creation)	175	99
Information and netwoking systems		
IT system	57	58
IT expenses	4	9
Description of IT facilities	46	5

Company culture and management philosophy

Corporate culture statements (vision, mission, key values, ethics code)	184	185
Company strategy description	89	175

Processes Management

Quality standard	80	93
Environmental standard	52	41
Performance measurement systems	47	127
Incentive and remuneration systems	45	66
Risk management (financial & health and safety)	41	61
Communication system	24	66

Research and development

Statements of policy, strategy and/or objectives of R&D activities	102	107
R&D investiment	19	17
Patents and Patents pending	9	11

Relational Capital

Distribution channels

Description and tipology	107	98
Number and geographic diversification	84	105
Economic performance	52	65

Business collaborations

Alliance and partnership (description and number)	86	58
License and franchising agreements (description and number)	8	1

University and Research Center collaboration

Typology and number	81	65
U & RC donations	6	8

Company reputation

Financial reputation (debt and stock rating)	62	66
Social reputation (description and number of award prize, survey)	31	28
Environmental reputation (description and number of award price)	2	6
Brand Imagine (Innovation & quality)	46	55

Customers

Typology and number of customers	90	154
Sales breakdown by costumer	21	22
Annual sales per segment or product	70	106
Description of customers involvement	45	78
Customers satisfaction	127	100
Market share	8	20
Market share by segment/product	54	61
Dependence on key customers	5	6
Geographic diversification	58	62
Customer litigations and legal actions	83	73

Suppliers		
Number of suppliers and geographic diversification	89	83
Contratual relationship and supplier policies	72	92
Certified quality of supplier	31	18
Supplier satisfaction and retention (indices, surveys)	23	19
Financial relationship		
Meeting with financial stakeholder (financial market company presentation, meeting with analyst, road show, etc)	122	96
Value added to investitor and shareholder	73	78
Community relationship		
Social and ethics activities*	170	161
Donations and other social expenses (amount)	79	78
*main activities		