Intellectual capital disclosure in Chinese and Indian information technology companies: A comparative analysis

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Abstract:

Purpose: The purpose of this paper is to examine the extent and quality of voluntary intellectual disclosures by information technology companies of China and India.

Research Design/ Methodology: The research method adopted for this study is content analysis. The research is limited to the intellectual capital information disclosed in companies' annual report. The sample for this research is based on 20 information technology (IT) companies listed by market captalisation listed on Shenzhen or Shanghai stock exchange market, and the largest 20 companies listed on Indian stock market.

Findings: Indian IT companies tends to perform better than Chinese IT companies in extent and quality of disclosures. The extent of disclosure of both countries is at a relatively high level. The most frequently reported disclosure category in India is external capital, while the least one is human capital. In China, external capital is the most frequently disclosed category, while the internal capital is the least one.

Limitations/ Implications: The sample size of the study is relatively small. Future research can expand on the sample size to get an overview of the intellectual capital disclosure, and conduct a longitudinal study to capture the trend of reporting practices.

Originality: Previous studies of intellectual capital (IC) disclosure have covered little on the relationship between market capitalization and quality of disclosure and cross-country disclosure on IC. This research tends to extend the literature on intellectual capital disclosure.

Key words: intellectual capital, China, India, information technology, disclosure.

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1.0 Introduction

In the new information age (Schneider and Samkin, 2008), the economy is increasingly driven by knowledge (Bontis *et al*., 1999; Schneider and Samkin, 2008; Liao *et al*., 2013). Knowledge is one of the important factors for business to gain and maintain a competitive business advantage (Ghosh and Wu, 2007). Intellectual capital is becoming the key factor of underlying value creation (Liao *et al.*, 2013; Williams, 2001). However, the balance sheet of a company fails to disclose the value of intellectual capital and only shows the value of tangible assets. Some practitioners and regulators have criticized that the disclosure of intangibles is inadequate (Bismuth and Tojo, 2008; Ariff *et al*., 2014), partly due to the conservative reporting rules for intangibles. A gap persists between what shareholders want and what companies provide.

Intellectual capital is a popular term used by some companies which depends on the skills, knowledge and experience of employees (Joshi *et al.*, 2012). The information technology (IT) sector reflects IC as the productivity of IT companies which mainly relies on the knowledge and innovation of employees. Joshi *et al.* (2012) suggest that "highly skilled employees, robust training and innovation largely decide the success of such companies" (p.583). Moreover, the disclosure of IC in IT sector becomes an important signal to inform stakeholders' affairs of companies, especially in an increasing competitive world (Abeysekera, 2008).

Only three studies (Xiao, 2008; Yi and Davey, 2010; Liao *et al*, 2013) related to Chinese companies. All these studies are cross-sectional. Moreover, little research compares IC disclosure between two countries.

The purpose of this paper is to examine the extent and quality of voluntary IC disclosures by IT companies of China and India. This paper examines 20 publicly listed IT companies in each country. Section 2 sets out the background of the

two economies, IT industries and stock markets. Section 3 delineates the literature on IC and prior research. Section 4 describes methods. Section 5 outlines the results and discussion which is followed by section 6 on conclusion.

2.0 Economic comparisons: China and India

China and India are developing countries in Asia-Pacific with rapid economic growth. The GDP growth rates in both countries are relatively higher than developed countries (Euromonitor International, 2015a, b). For example, the real GDP growth rates of China and India in 2014 are nearly three times of the real GDP growth rate of the USA in 2014 (Euromonitor International, 2015a, b, d). Many companies in developed countries outsource manufacturing businesses to China and India.

The gap between rich and poor exists in both China and India. For example, 76% of India's 1.2 billion people live on less than US$2 per day (Euromonitor International, 2015b), and the income of urban households in China is, on average, several times higher than that of rural households (Euromonitor International, 2015a). Fujita and Hu (2001) note that globalization and economic liberalization play important roles in the increasing inequality in China, because of the highly uneven distributions of trade and foreign direct investment (FDI).

Some differences persist between China and India. For China, the real GDP growth rate was 7.7% in 2013, but it slipped to 7.4% in 2014. The later was the lowest rate in 24 years (Euromonitor International, 2015a), because of the weakness of the country's external sector and government efforts to rebalance the economy (Euromonitor International, 2015c). For India, the real GDP growth rate in 2013 was 6.9%, and it increased to 7.3% in 2014 (Euromonitor International, 2015b).

The workforce number is another comparison between China and India, because they are the two world's most populous countries. According to Euromonitor International (2015c), China faces demographic challenges, owing to its 'one-

child' policy. The proportion of those aged 65 or above had reached 11.7% in 2014, and will increase to 15.9% in 2020 (Euromonitor International, 2015a). The conditions in India are different. People above the age of 65 years in India only accounts for 5.3% of total population (Joshi *et al*., 2012), and nearly one million new job seekers enter the labor market monthly (Euromonitor International, 2015b). It also results in a high pressure of labor market.

Information technology industry comparisons

IT sector is a broad industry, which contains IT manufacturing and IT usage. IT manufacturing also includes manufacturing hardware, software telecommunication devices and IT services. Chinese IT companies are involved in manufacturing IT hardware and devices; while Indian IT companies are involved in IT services. It is a challenge to compare the whole IT industry of China and India, because of the blurry definition of information technology. This research focuses on IT services.

According to MarketLine (2015a), the Chinese IT services industry's compound annual growth rate (CAGR) for 2010-2014 was 12.4%. For the same period, the CAGR of Indian IT services market was 18.5% (MarketLine, 2015b). The value China's IT services market was $109.7 billion in 2014, which was relatively higher than that of India's $13 billion (MarketLine, 2015a, b). The research of MarketLine (2015a, b) showed that the annual growth rate of China's IT services market was 14.7%, and that of India's IT services markets was 10.2%. Table I shows the Chinese and Indian IT services industry market value for a five-year period from 2010 to 2014.

Table II shows market segments of IT services industry in both China and India. There are three segments: IT outsourcing and processing, IT consulting and support, and Cloud computing. The largest segment of China's IT services market is IT outsourcing and processing, which accounts for 50.4% of total market value in 2014. The cloud computing has the least share in the total market value with 1%. On the other hand in the India's IT services market, IT

outsourcing and processing has the largest share of 73.2% followed by IT consulting and support with 25.8%.

Table I. IT services industry value and % growth rate

	China		India	
Year	Value ($billion)	% Growth	Value ($billion)	% Growth
2010	68.7		6.6	
2011	79.0	14.9	8.3	25.9
2012	87.7	11.1	10.1	21.3
2013	95.6	9.0	11.8	17.3
2014	109.7	14.7	13.0	10.2
CAGR:2010-14		12.4		18.5
Sources: MarketLine (2015a,b) Industry Profiles, IT services in China and India				

Table II. Share of IT services market segments in 2014: China and India

Category	China (% share)	India (% share)
IT outsourcing & processing	50.4	73.2
IT consulting & support	47.6	25.8
Cloud computing	2.0	1.0
Total	100	100
Sources: MarketLine (2015a,b) Industry Profiles, IT services in China and India		

Stock Markets

There are two stock exchange markets in Mainland China: Shanghai stock exchange (SHSE) and Shenzhen stock exchange (SZSE), of which Shanghai is the larger exchange. In India, there are two main stock exchange markets: Bombay Stock Exchange (BSE) and National Stock Exchange (NSE). The main difference between Chinese and Indian stock exchanges is that Indian companies can publicly listed in both markets, but Chinese companies can only choose one of stock exchange market in Mainland China

3.0 Literature review

Intellectual capital

There is no generally accepted definition of intellectual capital (Sveiby, 1997; Schneider and Samkin, 2008; Yi and Davey, 2010), even though IC is the important resource for creating economic wealth and corporate growth (Lev, 2001; Ariff, *et al*., 2014) and factor in the successful achievement of

organizational objectives (Striukova *et al*., 2008). However, many researchers (Sveiby, 1997; Brooking, 1997; Stewart, 1997) have contributed to the definition of IC on the basis of their own knowledge of intellectual capital. For example, Stewart (1997) proposed that intellectual capital entails the talent of staff, the value of proprietary knowledge and processes, and the value of relationships with customers and suppliers, is knowledge that transforms raw materials into something more valuable.

Some previous studies (Sveiby, 1997; Brooking, 1997; Edvinsson and Malone, 1997) were involved in developing intellectual capital frameworks for the purpose of understanding intellectual capital (Brennan and Connell, 2000). Sveiby (1997) proposed an intellectual asset monitor, which includes three broad classification categories – internal structure, external structure and employee competence. The Skandia value scheme built by Edvinsson and Malone (1997) classified IC into two categories, human capital and structure capital. Brooking (1997) also developed an IC framework, which includes four categories: infrastructure assets, human assets, market assets and intellectual property assets.

In recent years, three categories: internal capital, external capital and human capital, developed by Sveiby (1997) have been widely adopted by many researchers in their empirical research (e.g. Yi and Davey, 2010; Liao *et al*., 2013; Wong and Gardner, 2005; Goh and Lim, 2004; April *et al*., 2003; Guthrie and Petty, 2000; An et al., 2014); these researcher, however, modified the IC items in each category on the basis of their research purposes.

Internal capital is created by employees and owned by the organisation (Sveiby, 1997), which may include patents, corporate culture, information system and firms' information system (Sveiby, 1997; Yi and Davey, 2010; Wong and Gardner, 2005). Usually, internal capital has a higher value than the value of tangible assets (Yi and Davey, 2010; Sveiby, 1997; Wong and Gardner, 2005).

External capital is the asset whose value is influenced by the firms' relationships with externals, such as customers, suppliers, brand and reputation building (Sveiby, 1997; Yi and Davey, 2010). Human capital refers to the capacity of employees, such as education, training and experience, to act in a variety of situations (Sveiby, 1997; Guthrie and Petty, 2000). The value of human capital is the accumulated value of investments in employee training, competence and the future (Pablos, 2002).

Prior Research on IC

Even though there is no unique definition of intellectual capital (Bukh, et al., 2001), the growing importance of IC provided greater academic attention to various aspects of IC since the mid-1990s (Striukova *et al.*, 2008). For instance, some early studies, such as Brooking (1997), Sveiby (1997), and Edvinsson and Malone (1997) focused on the IC framework and classification and Guthrie and Petty (2000) focused on the measurement and reporting of IC.

Recently, many empirical studies paid attention to the intellectual capital disclosure practice around the world (e.g. Yi and Davey, 2010; Liao *et al*., 2013; Schneider and Samkin, 2008; Goh and Lim, 2004; Whiting and Woodcok, 2011). In addition, most previous research has investigated the level and extent of IC disclosure in a specific country; for example, Australia (Guthrie and Petty, 2000), UK (Williams, 2001; Shareef and Davey, 2006), Canada (Bontis, 2003), Italy (Bozzolan *et al*., 2003), New Zealand (Wong and Gardner, 2005; Whiting and Miller, 2008), Spain (Oliveras et al., 2008), China (Yi and Davey, 2010; Liao *et al*., 2013), Malaysia (Goh and Lim, 2004), India (Kamath, 2007, 2008) and Sri Lanka (Abeysekera and Guthrie, 2005). However, only last four, among these studies, investigated IC disclosure relating to developing countries.

Guthrie and Petty (2000) analysed annual reports of 20 publicly listed companies in Australia in 1998. They found that only a few companies were interested in measuring and reporting IC, and there was a lack of a mutually agreed framework for measuring and reporting IC by large Australian companies. Some other studies (Brennan, 2001; Bontis, 2003; Xiao, 2008; Yi and Davey,

2010; Singh and Kansal, 2011) also made similar conclusions that IC is rarely reported.

Most studies on the extent of IC disclosure in a particular country were across different industries (Yi and Davey, 2010), but their findings on the determinant of the decision to disclose IC were different. Bozzolan *et al.*'s (2003) study on 30 Italian non-financial listed companies found that industry and size are relevant factors in explaining the differences in IC reporting behaviors. This finding was similar to Bruggen *et al*.'s (2009) research in Australia that industry type and firm size play key roles as the determinants for the disclosure of IC in annual reports.

The knowledge on IC disclosure in a specific industry is limited, due to the lack of research (Yi and Davey, 2010). Only few studies researched the IC disclosure based on a specific industry; for example, Kamath (2007) analysed the Value Added Intellectual Coefficient for measuring the value-based performance of the Indian banking sector for a period from 2000 to 2004; Schneider and Samkin (2008) studied IC disclosure by 82 local government authorities in New Zealand in their annual reports; Joshi et al. (2011) investigated the top 20 information technology companies listed on the BSE; and Shareef and Davey (2006) examined the extent of IC disclosure by 19 football clubs in UK.

Some scholars compared the voluntary reporting of IC of two different countries, but such research is limited. Joshi et al. (2012) investigated and compared intellectual capital disclosures by Indian and Australian information technology companies. Abeysekera (2008) compared IC disclosure trend in Sri Lanka and Singapore, and found that IC disclosure differs between these two countries' companies. Guthrie *et al*. (2006) investigated the voluntary reporting of intellectual capital by comparing evidence from Hong Kong and Australia. Overall, there is no study, which is focusing on comparing Chinese intellectual capital disclosure to other countries.

4.0 Research Method

This research compares the annual reports for the 2014 financial year of top 20 Chinese IT companies to those of Indian companies. The research method adopted for this research study is content analysis.

Various mechanisms, such as Official Website, newspaper and Journals, are used by companies to disseminate intellectual capital information. This study is limited to the intellectual capital information disclosed in companies' annual reports. Campbell (2000) and Williams (2001) stated that annual report of the company is generally the most widely distributed of all publicly documents; moreover, the management of the company can control the discretionary disclosure of information in this document.

The initial sample constituted the largest 20 IT companies by market capitalization listed on Shenzhen or Shanghai stock exchange market, and the largest 20 companies listed on Indian exchange market for the year 2014. The main reason to limit data collection to publicly listed companies is that it is easier to collect annual reports of listed companies from websites. According to Garcia-Meca *et al.* (2005), more information is needed by stakeholders in larger companies; for example, larger companies are in the pressure to exercise social responsibility such as price control or higher corporate taxes (Jensen and Meckling, 1976; Garcia-Meca *et al.*, 2005; Branco, et al., 2010). However, the cost of gathering and preparing detailed information is lower for larger companies because of more resources and superior expertise (Branco, et al., 2010).

The top 20 Chinese listed IT companies by market capitalization was selected as Chinese sample. For Indian sample, the authors analysed the top 20 listed IT companies as well. However, at the time of collecting data, the authors could not find four companies' annual reports among the top 20 companies. Then the next four companies ranked by market capitalization was selected, while two companies did not disclose their annual reports on their official websites. As a result, the next two companies, which were ranked as 25 and 26, were selected in the sample.

Content analysis

Content analysis is adopted as the main framework for examining corporate annual reports with the aim of providing an overview of intellectual capital reporting practices (Guthrie and Petty, 2000). Content analysis is defined as a technique for gathering data (Abeysekera, 2007), which involves codifying qualitative and quantitative information into pre-defined categories in order to derive quantitative scales of varying levels of complexity (Guthrie *et al.*, 2004; Guthrie and Petty, 2000; Abeysekera, 2007).

In recent years, content analysis of annual reports is regarded as one of the most important and widely used research methodology (Krippendorf, 1980; Milne and Adler, 1999; Ahmed Haji and Mohd Ghazali, 2012), because it has been held to be empirically valid in the corporate social, intellectual capital disclosure, ethical and environmental reporting fields of accounting research (Guthrie and Parker, 1990; Schneider and Samkin, 2008; Guthrie and Petty, 2000; Yi and Davey, 2010; Guthrie *et al.*, 2004). In the area of intellectual capital disclosure, content analysis is undertaken as follows. Qualitative data was coded in the coding sheet in accordance with a selected framework of intellectual capital indicators (e.g. Internal capital, External capital and Human capital), after reading the annual report (Guthrie and Petty, 2000). The coding sheet recorded the quality score of IC items for each company. The frequency of disclosure can be calculated by counting the number of companies disclosing the specific items.

There are some limitations in adopting content analysis (Milne and Adler, 1999; Unerman, 2000; Guthrie *et al*., 2004). For example, subjectivity would be involved in the process of coding (Frost and Wilmshurst, 2000; Guthrie *et al*., 2004), which would affect the reliability of data. However, content analysis has been widely adopted in various accounting research, such as ethical and environmental reporting, to evaluate the extent of disclosure of various items (Ahmed Haji and Mohd Ghazali, 2012; Guthrie et al., 2004; Schneider and Samkin, 2008; Yi and Davey, 2010).

Construction of IC disclosure index

A disclosure index is a qualitative-based tool (Coy, 1995; Yi and Davey, 2010), used to quantify the amount of information relating to intellectual capital included in the prospectus (Nikolaj Bukh et al., 2005). The function of disclosure index would be realized through giving "a surrogate score indicative of the level of disclosure in the specific context for which the index was devised" (Coy, 1995, p. 121).

Three steps are involved in constructing disclosure index. The first step is to identify a list of items. Disclosure index contains an extensive list of selected items, which may be disclosed in annual reports (Marston and Shrievs, 1991). Nikolaj Bukh *et al.* (2005) point out that the items included in the index vary among different studies. Researchers could select items on the basis of Sveiby's (1997) three IC categories and some prior literature (Guthrie *et al*., 2006; Guthrie and Petty, 2000; Yi and Davey, 2010; Liao *et al*., 2013), and authors knowledge on Chinese and Indian IT industry.

According to Sveiby (1997), intellectual capital can be divided into three categories: internal capital, external capital and human capital. The list of IC items will be allocated into these three categories, and different researchers will have different allocations. Yi and Davey (2010) claimed that twenty-one IC items (eight for internal capital; eight for external capital; five for human capital) were more likely to be disclosed by Chinese companies, and they simplified the framework into sixteen items (five relating to internal capital; seven relating to external capital; four relating to human capital); However, Liao et al. (2013) listed twelve items in disclosure index (five for internal capital; five for external capital; two for human capital). In this research, the author selected fifteen items, which were allocated into three categories (seven for internal capital; four for external capital; and four for human capital) based on authors' knowledge of Chinese and Indian IT industry. Based on the preliminary twenty-one items (Appendix V), the authors amalgamated some similar items into one item. For example, patents, copyrights and trademarks were combined under the heading of intellectual property; management philosophy and corporate culture were combined as corporate culture; brands and company names were combined

under the heading of goodwill. Research and development, and subsidiaries were added into internal capital. The research and development plays an important role in IT companies. Many companies, especially the companies with large market capitalization, have subsidiaries. The final fifteen items are listed in Table IV, and the description of these items is provided in Table V.

The second step in the construction of a disclosure index is the decision on scale scheme, which can be applied to measure the quality of disclosure. The selection of scale scheme used to score IC items varies between specific studies. For instance, Shareef and Davey (2006), Schneider and Samkin (2008) and Yi and Davey (2010) adopted a six-point scale (from 0 to five); Bozzolan et al. (2003) and Whiting and Miller (2008) established the quality criteria on a three-point scale (from 0 to 2, 0 for non-disclosure, 1 for qualitative disclosure and 2 for quantitative disclosure); Brennan (2001), Williams (2001) and Abeysekera and Guthrie (2005) used a two-point scale (0-1, 0 represents non-disclosure and 1 represents disclosure). In this research, a five-point (0-4) scale will be adopted to assess the quality of IC disclosure. The details of the five-point scale adopted by Liao et al. (2013) are described as follows:

- No-disclosure (0): the disclosure information does not appear in annual reports;
- Narrative (1): the disclosure information is presented in a narrative form;
- Numerical (2): the disclosure items are presented in a numerical form;
- Monetary (3): the disclosure items are presented in a monetary form;
- Qualitative and quantitative (4): the disclosure is clear with combination of qualitative and quantitative information.

Table IV. IC index

Internal Capital	**External Capital**	**Human Capital**
Intellectual property	Goodwill	Employee
Corporate culture	Stakeholder relationship	Education/Training
Management process/Strategy	Market share	*Work related knowledge*
Research and development	Business partnership	*Employee satisfaction*
Information technology		
Financial relations		
Subsidiaries		

Table V. Description of IC attributes

	Items	Description
1	**Internal Capital**	
1.1	Intellectual property	Patents, copyrights and trademarks
1.2	*Corporate culture*	Vision, attitudes, experiences, beliefs and value of a company
1.3	*Management process/strategy*	Relating to process within a company
1.4	Research and development	Details on research and development
1.5	Information technology	Details on the development, application and impact of information system
1.6	Financial relations	Relationships between the company and finance providers
1.7	Subsidiaries	Company contribution and effects from subsidiaries
2	**External Capital**	
2.1	Goodwill	Details on brand recognition and building
2.2	Stakeholder relationship	Relationships with stakeholders: social responsibility, government relationship, waste reduction, environment protection and customer relationships
2.3	Market share	Information about the market share of a company
2.4	Business partnership	Relationship with partners
3	**Human Capital**	
3.1	Employee	Information relating to employees
3.2	Education/training	Education or training program provided by a company
3.3	*Work related knowledge*	Obtained from the job or training by employees
3.4	*Employee satisfaction*	Empolyee support, safety, retention, work-family balance, motivation, and satisfaction

Four intellectual capital items (Corporate Culture, Management Process, Work Related Knowledge and Employee Satisfaction) are difficult to be measured in numerical form, as they are narrative in nature. These items are assigned a maximum score of one. The quality score of each item will be normalised to a scale of 0 to 1, because of comparability (Yi and Davey, 2010).

The third step of constructing disclosure index is to decide the weighting method while measuring the disclosure quality of each company. Different IC categories have varying degrees of importance for researchers (Marston and Shrievs, 1991). Different company may assign different weights to each IC category (Liao *et al*., 2013). For example, human is an important capital for IT companies for competition. As a result, human capital may be more important than the other two IC categories in IT industry. Thereby, it is more accurate to use different

weighting methods to measure the quality of disclosure by each company (Liao *et al.,* 2013; Marston and Shrievs, 1991).

This research adopts three weighting methods. The first method calculates the weight of each IC category based on the disclosure frequency (China: internal capital 29%, external capital 41%, human capital 30%; India: internal capital 33%, external 37%, human capital 30%), which was used by Yi and Davey (2010). The items in the same category have the same weights. The second method allocates equal weight to each category, which means that each IC category accounts for 33%. This method assumes that the three categories have the same degree of importance. The third method is based on the number of items in each IC category (internal capital 46%, external capital 27%, and human capital 27%). It assumes that the category is easier to be found in annual reports with more items in the category (Liao *et al.*, 2013).

5.0 Result and Discussion

Overview

Indian IT companies' annual reports disclose not only more intellectual capital but also in better quality than Chinese IT companies. Both countries' IT companies disclosed human capital in the highest quality and internal capital in the lowest quality. This research adopted three different weighting methods to assess the disclosure quality of each company, and the results suggested that there is no significant difference among those three methods. In China, the quality of disclosure measured by Method 1 (based on frequency of disclosure) does not have significant relationship with companies' market capitalisation; while in India, the quality of disclosure measured by three methods has significant relationship with market capitalisation.

The extent and quality of IC disclosure by attributes

Quality

Mean score [1] is a quality measure for the disclosure of IC items, which has been transferred to a scale of zero to one for comparison. This is because it is challenging to compare each other with different maximum scores. The

maximum score of some items (e.g. Management process/Strategy, Corporate culture, Work related knowledge and Employee Satisfaction) is one, while the others' are four. The results of two countries' mean scores for all items are disclosed in Table VII (China) and VIII (India).

From Table VII, Chinese listed companies disclosed "Management process/Strategy" and "Employee" in a high quality with a mean score of one. It means that all the sample companies have disclosed the item of "Employee" with qualitative and quantitative information, and disclosed "Management process/Strategy", which cannot be measured, in a narrative method. Compared to Chinese IT companies, Indian IT companies have disclosed "Work related knowledge" in a higher quality. This is because the mean score of Indian companies was 1, while the mean score of Chinese companies was 0.9. Six items' mean scores were higher than or equal to 0.9 in Chinese sample, while only four items' mean scores were higher than 0.9 in Indian sample. "Financial relations", "Information technology", and "Employee satisfaction" are the last three IC items in the rank list of disclosure quality in China and India. Comparing the lower quality level, Indian companies performed better than Chinese companies. There was no item where mean score was lower than 0.1 in Indian IT companies. In Chinese sample, however, there are three items (e.g. Financial relations, Information technology, Employee satisfaction) where mean scores were lower than 0.1. In addition, the mean score of "Employee satisfaction" for Chinese companies was zero, which means that none of Chinese sample companies disclosed this item in their annual reports.

Overall, the quality of disclosure for Chinese and Indian IT companies' annual reports is in a similar level, but Indian IT companies reported better than Chinese IT companies. The comparable table is presented in Appendix III. Both countries' IT companies prefer to disclose IC items in a descriptive form with some numerical description. However, Indian companies performed better than Chinese companies. For example, Chinese companies scored 62 zero marks, while Indian companies scored 32 zero marks (zero means no disclosure in annual reports).

Table VII. Overall disclosure scores-China

Items		Mean Score
1.3	*Management process/Strategy*	1.00
3.1	Employee	1.00
1.7	Subsidiaries	0.99
1.4	R&D	0.96
2.4	Business partnership	0.96
3.3	*Work related knowledge*	0.90
2.1	Goodwill	0.85
1.1	Intellectual property	0.73
1.2	*Corporate culture*	0.60
3.2	Education/Training	0.51
2.3	Market share	0.33
2.2	Stakeholder relationship	0.26
1.6	Financial relations	0.08
1.5	Information technology	0.03
3.4	*Employee satisfaction*	0.00

Table VIII. Overall disclosure scores-India

Items		Mean Score
1.3	*Management process/Strategy*	1.00
3.1	Employee	1.00
3.3	*Work related knowledge*	1.00
2.2	Stakeholder relationship	0.95
1.7	Subsidiaries	0.80
1.1	Intellectual property	0.76
1.2	*Corporate culture*	0.75
1.4	R&D	0.73
2.4	Business partnership	0.64
2.1	Goodwill	0.53
3.2	Education/Training	0.53
2.3	Market share	0.35
1.6	Financial relations	0.29
3.4	*Employee satisfaction*	0.25
1.5	Information technology	0.16

Extent

The extent of disclosure is measured by the frequency, which is equal to number of companies disclosing each IC items. The results of frequency were shown in Table IX (China) and X (India). From these two Tables, it can be concluded that

ten IC items have been disclosed by all sampled IT companies in China and India. The only difference was in the content of these ten items. All Chinese sample companies disclosed item of "Subsidiaries", while one Indian sample companies did not disclose this item. For "Work related knowledge" item, all Indian companies mentioned this item in their annual reports, whereas two Chinese sample companies missed this item. Although the least frequently disclosed item in both countries was "Employee satisfaction", the disclosure extent of this item in two countries was different. There were five Indian companies that disclosed "Employee satisfaction", but none of Chinese companies disclosed "Employee satisfaction". Chinese sample companies also reported "Financial relations" and "information technology" in a relatively low frequency. In summary, the Indian IT companies reported more IC items in their annual reports than Chinese IT companies, and the comparable table is presented in Appendix IV.

Table IX. Overall disclosure frequency-China

Items		Frequency
1.1	Intellectual property	20
1.3	*Management process/Strategy*	20
1.4	R&D	20
1.7	Subsidiaries	20
2.1	Goodwill	20
2.2	Stakeholder relationship	20
2.3	Market share	20
2.4	Business partnership	20
3.1	Employee	20
3.2	Education/training	20
3.3	*Work related knowledge*	18
1.2	*Corporate culture*	12
1.6	Financial relations	6
1.5	Information technology	2
3.4	*Employee satisfaction*	0

Table X. Overall disclosure frequency-India

Items		Frequency
1.1	Intellectual property	20
1.3	*Management process/Strategy*	20
1.4	R&D	20
2.1	Goodwill	20
2.2	Stakeholder relationship	20
2.3	Market share	20
2.4	Business partnership	20
3.1	Employee	20
3.2	Education/training	20
3.3	*Work related knowledge*	20
1.7	Subsidiaries	19
1.6	Financial relations	16
1.2	*Corporate culture*	15
1.5	Information technology	13
3.4	*Employee satisfaction*	5

Internal capital attribute

China (Table XI)

"Intellectual property", "Management process/Strategy", "Research and Development", and "Subsidiaries" were the most frequently reported internal capital items, being reported by all sample companies. In the meanwhile, "Management process/Strategy" had the highest disclosure level among internal capital items with a maximum mean score of 1. "Subsidiaries" and "Research and development" had a relatively higher disclosure quality, because both acquired a mean score higher than 0.95. More than half companies had disclosed "Corporate culture" in their annual reports with a mean score of 0.6. "Financial relation" was only reported by 6 companies out of 20, with a low quality (0.08) in this category. The least frequently reported item among internal capital attribute was "Information technology", being reported by 2 companies with the lowest disclosure quality (0.03). Only two sample companies reported what information technology have been adopted in their companies.

India (Table XII)

"Intellectual property", "Management Process/Strategy", and "Research and Development" were the most frequently disclosed internal capital items. All

Indian sample companies reported these items. In the meanwhile, "Management process/Strategy" had the highest disclosure quality among internal capital items, with a mean score of 1. All companies had reported this information in their annual report. "Intellectual property", "Corporate culture" and "Research and development" had a relatively high disclosure quality (0.73-0.76). "Subsidiaries" had a relatively high extent of disclosure among internal capital items, since only one company did not report information of subsidiaries, and it was well reported with a mean score of 0.8. Although "Financial relation" had been reported by 16 companies out of 20, it was disclosed in a quite low quality (0.29). Many companies disclosed this item in a narrative method. "Information technology" was the least disclosed item with the lowest quality not only in the category but also among the total IC items, whose mean score was 0.16.

Both countries' annual reports in IT industry disclosed "Intellectual capital", "Management process/Strategy", "Research and development" and "Subsidiaries" in a relatively high extent, but Chinese companies disclosed these four items in a relatively higher quality. For the items of "Information technology" and "Financial relation", however, Indian companies reported better than Chinese companies. This is shaped by more than half Indian companies disclosing these two items in a descriptive form, while most of Chinese companies did not report these two items in their annual reports. As a result, Indian IT companies disclosed more internal capital than Chinese IT companies, but the disclosure quality of internal capital category for two countries' companies was at the same level. Indian IT companies could pay more attention on the quality of disclosing internal capital items. They should try to disclose information with more monetary description. However, Chinese companies should try to disclose more internal capital information, especially "information technology" and "financial relations" in their annual reports.

External capital attribute

China (Table XIII)

All external capital items had been disclosed by all Chinese sample companies, but being reported in different qualities. The mean score of "Business

partnership" was 0.96, which was the highest in external capital category. This is because 18 companies out of 20 disclosed this item with full scores (4). "Goodwill" was also well reported with a high mean score (0.85). However, the mean score of "Stakeholder relationship" was only 0.26, which indicates that the item of "Stakeholder relationship" was reported in the lowest quality. This is because almost all Chinese sample companies only mentioned what they did to the society or how they act in a sustainable method. "Market share" was disclosed in a quite low quality by Chinese sample companies with a mean score of 0.33. This is because only six companies had mentioned their market share ranking or percentage in their annual reports.

India (Table XIV)

All external capital items had also been reported by all Indian sample companies in their annual reports. However, the quality of disclosure among four items was different. "Stakeholder relationship" owned the highest disclosure quality among external capital attribute, with a mean score of 0.95. It means that nearly all companies had disclosed this item with qualitative and quantitative information. "Goodwill" and "Business partnership" were reported at the mid-level quality (0.53 and 0.64). The mean score of "Market share" was 0.35, which is the lowest among external capital items. Almost 70% companies prefer to disclose market share in a narrative way. For example, nearly all companies had mentioned that they are devoted to the increase of market share. Only one company had reported the value of its market share.

From Table XIII and XIV, it can be found that all Chinese and Indian companies disclosed all external capital items but with different disclosure quality. Indian companies disclosed "Stakeholder relationship" in a high quality, as they attached Corporate Social Responsibility report in annual reports. However, Chinese companies only mentioned what they did to the society in a descriptive way. Both Chinese and Indian companies reported "market share" in a relatively low quality.

Human capital attribute

China (Table XV)

"Employee" and "Education/Training" were the most frequently reported items among human capital category. However, there was a huge difference between these two IC items' disclosure quality. "Employee" was the highest rated item among human capital. This is because all Chinese sample companies had clearly reported the number of employees, the salaries to employees and the remuneration to directors. However, only one company had mentioned how much money they spent on training programs. The other companies only reported the hours of training each employee can get from the company, or the percentage of employees' education level. The disclosure quality of "Work related knowledge" was at a quite high level (0.9). The maximum score for "Work related knowledge" is one. Companies can acquire the maximum score if they have mentioned what kind of knowledge employees can learn from working. The lowest frequency and quality of disclosure is "Employee satisfaction", as no sample company reported this item in their annual reports.

India (Table XVI)

All Indian sample companies reported "Employee", "Education/Training" and "Work related knowledge" in their annual reports. Two of these three items ("Employee" and "Work related knowledge") were the highest rated item with the highest mean score 1. "Education/Training" was rated in the mid-level (0.53), which means its quality of disclosure is neither high nor low. "Employee Satisfaction" was the least frequently reported item with the lowest mean score 0.25.

Table XV and XVI indicated that Indian IT companies disclosed human capital more frequently with a higher quality than Chinese IT companies. Indian IT companies reported "Employee satisfaction" in a low extent and quality, while no Chinese IT companies disclosed this item. Although all companies disclosed the item of "Education/Training", the disclosure quality was not at a high level as fewer companies reported this item in a monetary form.

Table XI. Disclosure performance of internal capital items-China

		Frequence						Mean score
1	**Internal Capital**	0	1	2	3	4	Total	(0-1)
1.1	Intellectual property		1	8	3	8	20	0.73
1.2	*Corporate culture*	8	12				12	0.60
1.3	*Management process/Strategy*		20				20	1.00
1.4	R&D			1	1	18	20	0.96
1.5	Information technology	18	2				2	0.03
1.6	Financial relations	14	6				6	0.08
1.7	Subsidiaries				1	19	20	0.99

Table XII. Disclosure performance of internal capital items-India

		Frequence						Mean score
1	**Internal Capital**	0	1	2	3	4	Total	(0-1)
1.1	Intellectual property		2	1	11	6	20	0.76
1.2	*Corporate culture*	5	15				15	0.75
1.3	*Management process/Strategy*		20				20	1.00
1.4	R&D		5	2	3	10	20	0.73
1.5	Information technology	7	13				13	0.16
1.6	Financial relations	4	13		2	1	16	0.29
1.7	Subsidiaries	1	1	4	1	13	19	0.80

Table XIII. Disclosure performance of external capital items-China

		Frequence						Mean score
	External Capital	0	1	2	3	4	Total	(0-1)
2.1	Goodwill		2	1	4	13	20	0.85
2.2	Stakeholder relationship		19	1			20	0.26
2.3	Market share		14	6			20	0.33
2.4	Business partnership			1	1	18	20	0.96

Table XIV. . Disclosure performance of external capital items-India

		Frequence						Mean score
	External Capital	0	1	2	3	4	Total	(0-1)
2.1	Goodwill		11		5	4	20	0.53
2.2	Stakeholder relationship			2		18	20	0.95
2.3	Market share		14	5		1	20	0.35
2.4	Business partnership		3	10		7	20	0.64

Table XV. Disclosure performance of human capital items-China

		Frequence						Mean score
	Human Capital	0	1	2	3	4	Total	(0-1)
3.1	Employee					20	20	1.00
3.2	Education/training			19	1		20	0.51
3.3	*Work related knowledge*	2	18				18	0.90
3.4	*Employee satisfaction*	20					0	0.00

Table XVI. Disclosure performance of human capital items-India

		Frequence						Mean score
	Human Capital	0	1	2	3	4	Total	(0-1)
3.1	Employee					20	20	1.00
3.2	Education/training		7	7	3	3	20	0.53
3.3	*Work related knowledge*		20				20	1.00
3.4	*Employee satisfaction*	15	5				5	0.25

Quality of IC Disclosure

China

Table VII represents the Chinese companies' mean disclosure quality by reporting categories compared with the frequency of disclosure. The category with highest disclosure quality was human capital attribute, while the category with lowest disclosure quality was internal capital attribute. The gap in disclosure quality between these two categories was 0.11. However, the rank of frequency of disclosure by three categories was different. External capital attribute, for Chinese sample companies, was the most frequently disclosed category (0.41), while internal capital attribute was the least frequently disclosed category (0.29). The gap in frequency of disclosure was 0.12, which is quite similar with the gap in quality of disclosure. The findings suggest that the relationship between quality and extent of disclosure in Chinese companies is not clear. Although internal capital had the lowest disclosure quality and frequency, the category with highest disclosure quality and frequency was different.

India

Table VIII shows that the gap among three categories in quality of IC disclosure for Indian sample companies was 0.16, which was larger than the gap in frequency of disclosure (0.07). In the results of disclosure quality, human capital attribute had the highest mean score (0.74), while internal capital attribute had the lowest mean score (0.58). This result suggests that both Chinese and Indian sample companies had the same rank in quality of disclosure by categories. However, in the result of disclosure extent, human capital attribute, which had the highest quality of disclosure, was the least frequently disclosed category (0.3), while external capital attribute was the most frequently disclosed category

(0.37) by Indian sample companies. These findings indicated that there is no relationship between the quality and frequency of disclosure.

Table VII. Mean disclosure quality compared with frequency of disclosure-China

Category	Internal capital	External capital	Human capital
Quality of disclosure (Mean Score)	0.58	0.60	0.69
Frequency of disclosure	0.29	0.41	0.30

Table VIII. Mean disclosure quality compared with frequency of disclosure-India

Category	Internal capital	External capital	Human capital
Quality of disclosure (Mean Score)	0.58	0.62	0.74
Frequency of disclosure	0.33	0.37	0.30

In summary, IT companies in both China and India disclosed human capital category in the highest quality and internal capital in the lowest quality. The gap between these two categories in India is larger than the gap in China. One important finding is that there is no clear relationship between quality and frequency of disclosure among Chinese and Indian IT companies.

The extent and quality of IC disclosure by companies (refer Appendix 1 &2)

Extent

China

For all intellectual capital disclosure items, the average number of items disclosed by each company was 11.9 out of the maximum 15. The maximum number of items reported was 14, which was reported by ZTE Corporation. Two companies (TCL Corporation, & Shenzhen O-Film Tech. Co., Ltd.) disclosed 13 intellectual capital disclosure items in their annual reports. The minimum number of items disclosed by sample companies was 11, and six companies reported IC disclosure items in this extent. The other 11 sample companies reported 12 IC items in their annual reports.

Under Internal capital category, the mean disclosure was 5. Only one company (ZTE Corporation) disclosed all seven internal capital items. TCL Corporation and Shenzhen O-Film Tech. Co., Ltd., which are ranked the second at the same time, disclosed six internal capital items in their annual reports. Four companies

(Hangzhou New Century Information Technology Co., Ltd., Beijing Gehua Catv Network Co., Ltd., Shanghai Hyron Software Co., Ltd., & Beijing Teamsun Technology Co., Ltd.) disclosed four items of internal capital, which were ranked at the end of the sample company list.

With regards to external capital disclosure, the average frequency was 4 out of a possible maximum 4, which indicated all sample companies reported external capital items in their annual reports.

As to human capital category, the average disclosure was 2.9 out of 4. Nearly all sample companies (18) had disclosed three items of human capital. Only two companies (Wonders Information Co., Ltd., & DHC Software Co., Ltd.) disclosed two human capital items, which was the minimum number of items reported.

India

With regard to all intellectual capital disclosure items, the most frequently reported number was 13.4 out of the maximum 15. Five companies (Tata Consultancy Services Ltd., Infosys Ltd., Cyient Ltd., Persistent System Ltd., & Rolta Ltd.) reported all IC disclosure items. Four companies (Wipro Ltd., Tech Mahindra Ltd., NIIT Technologies Ltd., & Polaris Consulting and Services Ltd.) reported 14 items out of 15; six companies reported 13 items; and four companies (Mphasis Ltd., Tata Elxis Ltd., Intellect Design Arena Ltd., & SQS India BFSI Ltd.) reported 12 items out of 15. The minimum number of items reported was 11, which is disclosed by Mindtree Ltd.

The average number of internal capital items disclosed by Indian companies was 6.15 out of a maximum of 7. Nine companies reported all seven internal capital disclosure items, and six companies reported six items. Only one company, Mindtree Ltd., disclosed four internal capital disclosure items.

As to external capital disclosure items, all Indian sample companies had disclosed all four items in their annual reports. For human capital disclosure

items, the average number of items reported by Indian companies was 3.25 out of 4. Five companies (Tata Consultancy Services Ltd., Infosys Ltd., Cyient Ltd., Persistent System Ltd., & Rolta Ltd.) reported all four human capital items in their annual reports. The other companies reported three human capital items.

Quality

China (Appendix I)

As to internal capital disclosure items, the average score of all Chinese sample companies was 0.58. Nine companies acquired higher score than mean score. ZTE Corporation had the highest mean score 0.73, followed by TCL corporation and Shenzhen O-Film Tech. Co., Ltd. (0.68). The lowest disclosure score (0.45) in internal capital category was by Beihai Yinhe Industry Investment Co., Ltd.

With regards to external capital disclosure items, the mean score for all companies was 0.6. Eleven companies' score of external capital was higher than mean score. The highest disclosure score in external capital was achieved by GRG Banking Equipment Co., Ltd. Shenzhen O-Film Tech. Co., Ltd., which acquired second highest disclosure score in internal capital, got the lowest score in external capital disclosure.

Regarding human capital disclosure items, the mean disclosure score of all sample companies was 0.69. 17 companies owned disclosure score in human capital higher than average score. The highest disclosure score (0.9) was achieved by Hangzhou Hikvision Digital Technology Co., Ltd. The second highest score in human capital disclosure was 0.7, and there were 16 companies with this score. Westone Information Industry Inc. acquired the lowest disclosure score (0.4) in human capital items.

India (Appendix II)

The mean disclosure score of Indian sample companies in internal capital category was 0.58. Four companies (Tata Consultancy Services Ltd., Cyient Ltd., Ramco System Ltd., and Rolta Ltd.) scored the highest disclosure score 0.73. The lowest disclosure score in internal capital was 0.36, which was from Mindtree Ltd. and Mphasis Ltd.

As to external capital disclosure, the average score was 0.62. Twelve Indian sample companies scored higher than the mean score. The highest disclosure score in external capital was 0.88, which was achieved by Tata Consultancy Services Ltd. and Mindtree Ltd. Ramco System Ltd. got the lowest disclosure score 0.38.

Regarding human capital disclosure items, the mean score of all Indian sample companies was 0.74. Three companies (Tata Consultancy Services Ltd., Infosys Ltd., and Cyient Ltd.) acquired the maximum disclosure score (1) in human capital disclosure. The lowest disclosure score was 0.6, and there were six sample companies getting the lowest score.

Quality measured by three weighting methods

This research adopted three weighting methods in measuring disclosure quality of each sample company. By adopting different methods, the final quality score of each company would be different. The first method weights disclosure index based on the frequency of disclosure (China: internal capital 29%, external capital 41%, and human capital 30%; India: internal capital 33%, external capital 37%, and human capital 30%). The second method assigns equal weight to all categories (33% for each category). The third method is based on the number of IC items in each category (internal capital 46%, external 27%, human capital 27%).

Method 1: based on frequency of disclosure

China

Among Chinese sample companies, the average disclosure score was 0.62. The highest disclosure score report by Chinese companies was 0.70, which was achieved by Hangzhou Hikvision Digital Technology Co., Ltd. Three companies (Westone Information Industry Inc., Zhejiang Dahua Technology Co., Ltd., and Hangzhou New Century Information Technology Co., Ltd.) had the lowest disclosure score 0.56.

India

For Indian sample companies, the average disclosure score was 0.64, which was higher than those of Chinese companies. Tata Consultancy Services Ltd. reported IC disclosure items in the highest quality, with a mean score of 0.86. The second highest disclosure score was 0.77, which was achieved by two Indian companies (Infosys Ltd., and Cyient Ltd.). Geometric Ltd. disclosed IC disclosure items in the lowest quality, with a mean score of 0.53.

Method 2: adopting equal weight (33%) to all category

China

For Chinese sample companies, the average disclosure score was 0.62, which was same to the score calculated by method 1. From the table in appendix 1, it can be concluded that the rank of each company on the basis of final mean was same, except for the last two companies (Westone Information Industry Inc., and Hangzhou New Century Information Technology Co., Ltd.). When calculating the final mean score of each company adopting equal weight to all categories, the lowest disclosure score was 0.55, which was achieved by Westone Information Industry Inc.

India

Similar to the result of Chinese sample companies, the average disclosure score calculated by the second method was same to the score in method 1. The rank of each company based on the final mean score was quite similar, although the disclosure score of each company was slightly different. The highest score was 0.87, which was achieved by Tata Consultancy Services Ltd. Geometric Ltd. Had the lowest score of 0.53.

Method 3: based on the number of IC items

China

The average quality score for Chinese IT companies calculated on the basis of the number of IC items is 0.61. Different with Method 1 and 2, the highest quality score in Method 3 was achieved by TCL Corporation with a mean score of 0.69. The lowest quality score was 0.55, which was achieved by three companies

(Zhejiang Dahua Technology Co., Ltd., Hangzhou New Century Information Technology Co., Ltd. and Beihai Yinhe Industry Co., Ltd.).

India

The average quality score for Indian IT companies calculated by Method 3 is 0.63. The highest quality score in Method 3 was 0.84, which was achieved by Tata Consultancy Service Ltd. as well. Mphasis Ltd.'s quality of disclosure was the lowest with a mean score of 0.52.

Comparison of three methods

Table 19 and Table 20 represent the results of disclosure quality based on three different weighting methods for both Chinese and Indian IT companies. According to these two Tables, it can be concluded that there are strong positive correlation among three methods. This is because *r* was 0.9822 between Method 1 and 2, was 0.9488 between Method 2 and 3, was 0.9288 between Method 1 and 3 in Chinese sample companies; Similarly, *r* was 0.9978 between Method 1 and 2, was 0.9747 between Method 2 and 3, was 0.9644 between Method 1 and 3 in Indian companies. There is no large significance by using these three different weighting methods. Therefore, it is hard to decide which method is the best, which is same to the finding of Liao *et al*.'s research (2013). If a company was measured reporting in a high quality by one method, there is a great possibility that it will be scored high in the other two methods.

Table 19. Quality of Chinese annual reports: compare results of three methods

	Mean	Correlation	Significance
Quality measured by method 1	0.62	0.9822	0.0000
Quality measured by method 2	0.62		
Quality measured by method 2	0.62	0.9488	0.0000
Quality measured by method 3	0.61		
Quality measured by method 1	0.62	0.9289	0.0000
Quality measured by method 3	0.61		

Table 20. Quality of Indian annual reports: compare results of three methods

	Mean	Correlation	Significance
Quality measured by method 1	0.64	0.9978	0.0000
Quality measured by method 2	0.64		
Quality measured by method 2	0.64	0.9747	0.0000
Quality measured by method 3	0.63		
Quality measured by method 1	0.64	0.9644	0.0000
Quality measured by method 3	0.63		

Figure 1. Mean score of Chinese companies calculated by three methods

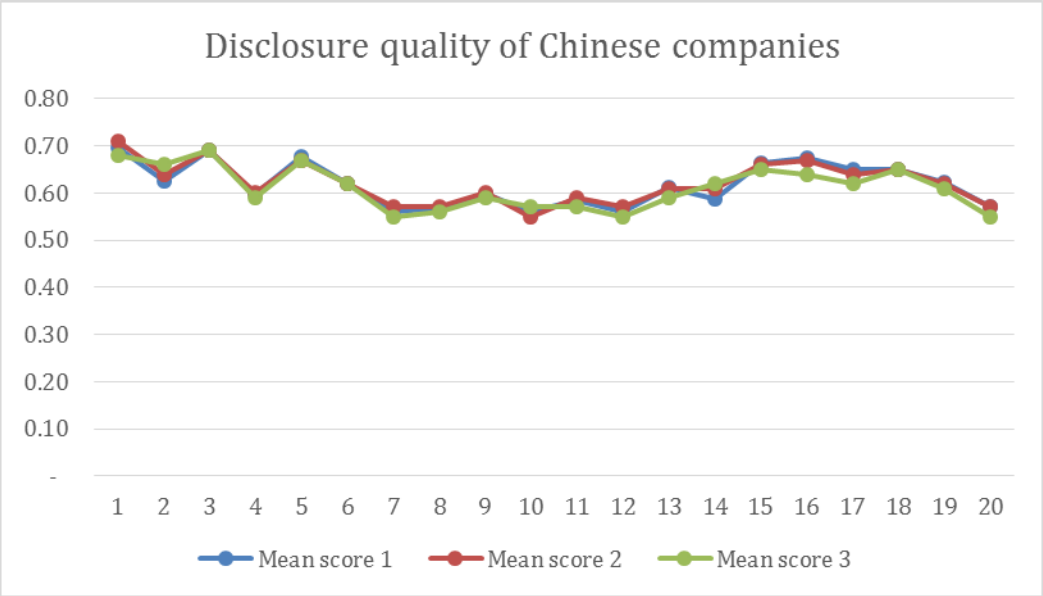
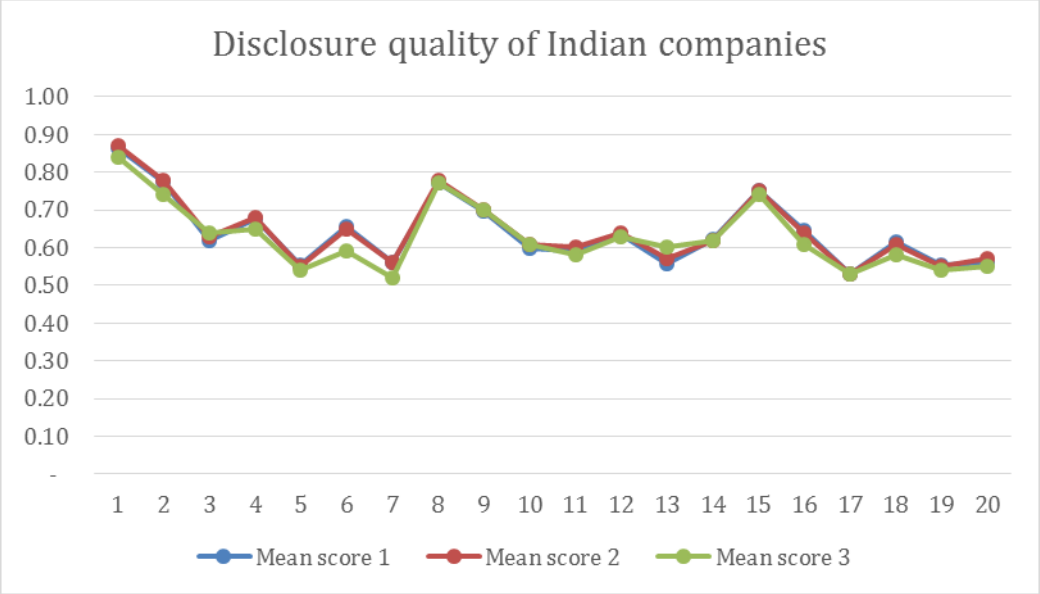


Figure 2. Mean score of Indian companies calculated by three methods



Relationship between the value of market capitalisation and quality of disclosure

Table 21 shows the results of regression between value of market capitalisation and quality of disclosure at 95% confidence level for Chinese and Indian IT industries. It can be concluded that there was a significant relationship at level $P<0.05$ between value of market capitalisation and quality of disclosure, except for the relationship between the value of market capitalisation and the quality measured on the basis of disclosure frequency. This is because the Significances or *P*-values were all lower than 0.05, except for the figure (0.0568) in the first row in Table 3.

The larger IT companies with more market capitalisation in China and India are more likely to disclose intellectual capital in higher quality in their annual reports.

Table 21. Regression between value of market capitalization and disclosure quality

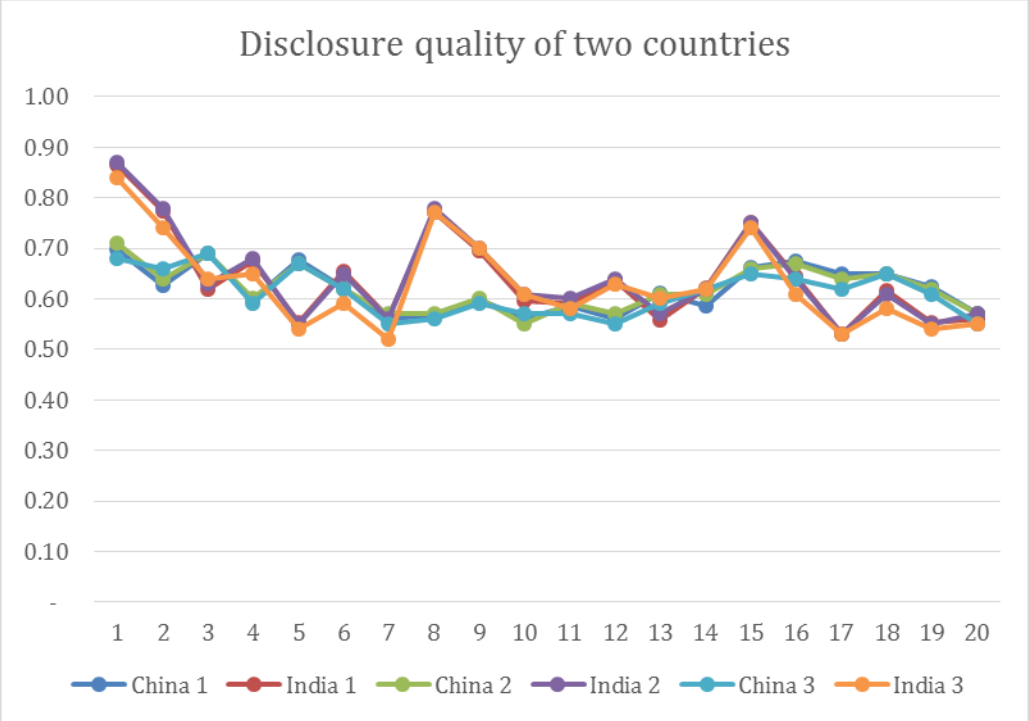
Countries	Weighting methods	Significance
China	Quality measured by method 1	0.0568
	Quality measured by method 2	0.0187
	Quality measured by method 3	0.0211
India	Quality measured by method 1	0.0014
	Quality measured by method 2	0.0012
	Quality measured by method 3	0.0020

Quality of disclosure compared by two countries

Figure 3 is used to compare the disclosure quality of two countries with considering the rank of market capitalization. From the Figure 3, it can be concluded that there is no large difference in Chinese disclosure quality, as the line is relatively flat; while the line of Indian IT companies are not as flat as

Chinese IT companies line. The line of Indian companies can be divided into three parts (1-7, 8-14, 14-20). In each part, the quality of disclosure is decreasing with the decrease in market capitalization. For the top two companies of market capitalization ranking in each country, the quality scores of India are much higher than the scores of China. The other companies with the same rank in two countries, except for the eighth and ninth companies, have the similar quality scores. For the last five companies in both countries, the quality score of Chinese companies are even higher than the quality score of Indian companies.

Figure 3. Compare the disclosure quality of two countries



It is challenging to decide which country discloses intellectual capital better than the other country. The results only indicated that although there is a positive relationship between the value of market capitalization and quality of disclosure among Chinese IT companies, the difference between the quality score of companies with highest market capitalization and the lowest market capitalization is not very large, which is relatively smaller than those of Indian companies. The main reason that shaped this circumstance is that nearly all

Chinese IT companies acquired the same score for each IC item. For example, 18 Chinese companies acquired four marks for the item of "Research and development", while 18 companies acquired zero for the item of "Information technology". Indian IT companies' quality scores, however, were not concentrated on one or two specified scores. For the item of "Research and development", 5 companies acquired one mark, 2 companies acquired two marks, three companies acquired three marks, and 10 companies acquired four marks. The disclosure quality gap between the company with highest and lowest market capitalization in China is smaller than that of India.

6.0 Conclusion

This paper examines the extent and quality of voluntary IC disclosures by IT companies of China and India. The top 20 publicly listed Chinese and India IT companies in the rank of market capitalisation were selected as the sample.

The Chinese IT services market size is higher than that of India. India still needs to expand its IT sector through increasing in-home usage and exports. The main findings of this exploratory study are as follows. Firstly, Indian IT companies perform better than Chinese IT companies in extent and quality of disclosures. However, the extent of disclosure of both countries is at a relatively high level, and the disclosure quality of both countries is not low. This finding contradicts the Joshi's et al. (2012), which noted that IC disclosures by Indian IT companies remain relatively low. However, the finding of Chinese IT companies is consistent with the finding of Yi and Davey (2010), which found that Chinese companies disclosed intellectual capital frequently without high quality. However, the quality of disclosure by Chinese IT companies in this research is higher than the disclosure quality of Chinese companies in Yi and Davey's (2010) research. Overall, the findings of this research indicated that companies have recognised the importance of IC disclosure, and there is an area for improving disclosure quality.

The most frequently reported disclosure category, in India, is external capital; while the least one is human capital. In China, external capital is the most frequently disclosed category, while internal capital is the least one, which is

consistent with Yi and Davey (2010). However, this finding is different from Liao's *et al.* (2013) research on Chinese version annual reports which indicated that internal capital is disclosed the most frequently while external capital is disclosed least frequently. The human capital is reported in the highest disclosure quality in both countries, while internal capital is reported in lowest quality. There is no relationship between the quality and frequency of disclosure among Chinese and Indian IT companies.

This study reinforces Liao's *et al.* (2013) idea that there is no significant difference among three weighting methods while assessing quality of disclosures. Therefore, future study on the quality of IC disclosure can adopt one of methods to calculate the quality scores.

A positive relationship exists between the value of market capitalisation and quality of disclosure. The larger companies with larger market capitalisation are more likely to disclose intellectual capital in a higher quality. However, the relationship between the rank of market capitalisation and quality of disclosure is not clear. Previous studies of intellectual capital disclosures have covered little on the relationship between market capitalisation and disclosure quality.

This study is subject to some limitations. The sample size of this study is relatively small. In addition, the sample companies are at the top of market capitalization of IT industry; thus, there is a risk that the results of sample companies cannot represent the Chinese and Indian IT industries' practices in intellectual capital disclosure. Future research can expand on the sample size to get an overview of intellectual capital disclosure, and conduct a longitudinal study to capture the trend of reporting practices. Future researchers can engage to interview market participants in order to understand the reasons of conducting intellectual capital disclosures. Finally, there is no common accepted IC reporting framework. Future studies can consider developing an IC disclosure framework that can be applied to all countries.

Note:

1. "Mean score" is a quality measure for the disclosure of IC items. Calculation examples for Chinese companies: Intellectual property: 0.73 = (0*0+1*1+2*8+3*3+4*8)/(4*20); Corporate culture: 0.6 = (0*8+1*12)/(1*20)

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Appendix

I. The scores of Chinese Companies

		Internal capital		External capital		Human capital		Final score			
Rank of M. C.	Company	No.	Mean score	No.	Mean score	No.	Mean score	No.	Method 1	Method 2	Method 3
1	Hangzhou Hikvision Digital Technology Co., Ltd.	5	0.59	4	0.63	3	0.90	12	0.70	0.71	0.68
2	ZTE Corporation	7	0.73	4	0.50	3	0.70	14	0.63	0.64	0.66
3	TCL Corporation	6	0.68	4	0.69	3	0.70	13	0.69	0.69	0.69
4	Yongyou Network Technology Co., Ltd	5	0.55	4	0.56	3	0.70	12	0.60	0.60	0.59
5	Tsinghua Tongfang Co., Ltd.	5	0.64	4	0.69	3	0.70	12	0.68	0.67	0.67
6	Wonders infromation Co., Ltd.	5	0.64	4	0.63	2	0.60	11	0.62	0.62	0.62
7	Zhejiang Dahua Technology Co., Ltd.	5	0.50	4	0.50	3	0.70	12	0.56	0.57	0.55
8	DHC Software Co., Ltd	5	0.55	4	0.56	2	0.60	11	0.57	0.57	0.56
9	Wangsu Science & Technology Co., Ltd.	5	0.55	4	0.56	3	0.70	12	0.60	0.60	0.59
10	Westone Information Industry Inc.	5	0.64	4	0.63	3	0.40	12	0.56	0.55	0.57
11	Beijing Shiji Information Technology Co., Ltd.	5	0.50	4	0.56	3	0.70	12	0.59	0.59	0.57
12	Hangzhou New century Information Technology Co., Ltd.	4	0.50	4	0.50	3	0.70	11	0.56	0.57	0.55
13	Beijing Gehua Catv Network Co., Ltd.	4	0.50	4	0.63	3	0.70	11	0.61	0.61	0.59
14	Shenzhen O-Film Tech. Co., Ltd.	6	0.68	4	0.44	3	0.70	13	0.59	0.61	0.62
15	Shanghai Hyron Software Co., Ltd.	4	0.59	4	0.69	3	0.70	11	0.66	0.66	0.65
16	GRG Banking Equipment Co., Ltd	5	0.55	4	0.75	3	0.70	12	0.68	0.67	0.64
17	Beijing Teamsun Technology CO., Ltd.	4	0.55	4	0.69	3	0.70	11	0.65	0.64	0.62
18	Digital China Information Service Company Ltd.	5	0.64	4	0.63	3	0.70	12	0.65	0.65	0.65
19	Shanghai Kingstar Winning Software Co., Ltd	5	0.55	4	0.63	3	0.70	12	0.62	0.62	0.61
20	Beihai Yinhe Industry Investment Co., Ltd.	5	0.45	4	0.56	3	0.70	12	0.57	0.57	0.55
	Total	100	11.55	80	12.00	58	13.70	238	12.37	12.41	12.23
	Mean	5	0.58	4	0.60	2.9	0.69	11.9	0.62	0.62	0.61
	Highest	7	0.73	4	0.75	3	0.90	14	0.70	0.71	0.69
	Lowest	4	0.45	4	0.44	2	0.40	11	0.56	0.55	0.55

II. The scores of Indian Companies

		Internal capital		External capital		Human capital		Final score			
Rank of M. C.	Company	No.	Mean score	No.	Mean score	No.	Mean score	No.	Method 1	Method 2	Method 3
1	Tata Consultancy Services Ltd.	7	0.73	4	0.88	4	1.00	15	0.86	0.87	0.84
2	Infosys Ltd.	7	0.59	4	0.75	4	1.00	15	0.77	0.78	0.74
3	Wipro Ltd.	7	0.68	4	0.50	3	0.70	14	0.62	0.63	0.64
4	Tech Mahindra Ltd.	7	0.55	4	0.69	3	0.80	14	0.68	0.68	0.65
5	Oracle Financial Services Software Ltd.	6	0.50	4	0.56	3	0.60	13	0.55	0.55	0.54
6	Mindtree Ltd.	4	0.36	4	0.88	3	0.70	11	0.66	0.65	0.59
7	Mphasis Ltd.	5	0.36	4	0.63	3	0.70	12	0.56	0.56	0.52
8	Cyient Ltd.	7	0.73	4	0.63	4	1.00	15	0.77	0.78	0.77
9	Persistent System Ltd.	7	0.68	4	0.63	4	0.80	15	0.70	0.7	0.7
10	Tata Elxsi Ltd.	5	0.59	4	0.44	3	0.80	12	0.60	0.61	0.61
11	Zensar Technologies Ltd.	6	0.50	4	0.50	3	0.80	13	0.59	0.6	0.58
12	NIIT Technologies Ltd.	7	0.59	4	0.63	3	0.70	14	0.64	0.64	0.63
13	Ramco System Ltd.	6	0.73	4	0.38	3	0.60	13	0.56	0.57	0.6
14	Polaris Consulting and Services Ltd.	7	0.64	4	0.63	3	0.60	14	0.62	0.62	0.62
15	Rolta Ltd.	7	0.73	4	0.81	4	0.70	15	0.75	0.75	0.74
16	Intellect Design Arena Ltd.	5	0.64	4	0.69	3	0.60	12	0.64	0.64	0.61
17	Geometric Ltd.	6	0.50	4	0.50	3	0.60	13	0.53	0.53	0.53
18	SQS India BFSI Ltd.	5	0.45	4	0.69	3	0.70	12	0.62	0.61	0.58
19	Sasken Communication Technologies Ltd.	6	0.50	4	0.56	3	0.60	13	0.55	0.55	0.54
20	Mastek Ltd.	6	0.50	4	0.50	3	0.70	13	0.56	0.57	0.55
	Total	123	11.55	80	12.44	65	14.70	268	12.83	12.89	12.58
	Mean	6.15	0.58	4.00	0.62	3.25	0.74	13.40	0.64	0.64	0.63
	Highest	7	0.73	4	0.88	4	1.00	15	0.86	0.87	0.84
	Lowest	4	0.36	4	0.38	3	0.60	11	0.53	0.53	0.52

III. Comparable table of IC disclosure quality between China and India

	Items	China-Quality	India-Quality
1.1	Intellectual property	0.73	0.76
1.2	*Corporate culture*	0.60	0.75
1.3	*Management process/Strategy*	1.00	1.00
1.4	Research and development	0.96	0.73
1.5	Information technology	0.03	0.16
1.6	Financial relations	0.08	0.29
1.7	Subsidiaries	0.99	0.80
2.1	Goodwill	0.85	0.53
2.2	Stakeholder relationship	0.26	0.95
2.3	Market share	0.33	0.35
2.4	Business partnership	0.96	0.64
3.1	Employee	1.00	1.00
3.2	Education/training	0.51	0.53
3.3	*Work related knowledge*	0.90	1.00
3.4	*Employee satisfaction*	0.00	0.25

IV. Comparable table of IC disclosure extent between China and India

	Items	China-Fre	India-Fre
1.1	Intellectual property	20	20
1.2	*Corporate culture*	12	15
1.3	*Management process/Strategy*	20	20
1.4	Research and development	20	20
1.5	Information technology	2	13
1.6	Financial relations	6	16
1.7	Subsidiaries	20	19
2.1	Goodwill	20	20
2.2	Stakeholder relationship	20	20
2.3	Market share	20	20
2.4	Business partnership	20	20
3.1	Employee	20	20
3.2	Education/training	20	20
3.3	*Work related knowledge*	18	20
3.4	*Employee satisfaction*	0	5

V. Preliminary list of IC items

Internal Capital	External Capital	Human Capital
Patents	Brands	Employee
Copyrights	Company names	Education
Trade marks	Customers	Training
Management philosophy	Customer satisfaction	Work-related knowledge
Corporate culture	Distribution channels	Entrepreneurial spirit
Information system	Business partnership	
Networking system	Licensing agreements	
Financial relations	Market share	