# Are XBRL-based Financial Reports Better than Non-XBRL Reports? A Quality Assessment

Zhenkun Wang, Simon S. Gao

*Abstract*—Using a scoring system, this paper provides a comparative assessment of the quality of data between XBRL formatted financial reports and non-XBRL financial reports. It shows a major improvement in the quality of data of XBRL formatted financial reports. Although XBRL formatted financial reports do not show much advantage in the quality at the beginning, XBRL financial reports lately display a large improvement in the quality of data in almost all aspects. With the improved XBRL web data managing, presentation and analysis applications, XBRL formatted financial reports have a much better accessibility, are more accurate and better in timeliness.

*Keywords*—Data Quality; Financial Report; Information; XBRL

## I. INTRODUCTION

THE Internet has significantly extended the amount of information available in digital format, therefore making information more accessible and usable. Sharing and exchanging of information via the Internet are now changing the world. The change has not only improved the global economy, but also created new opportunities and new challenges for business [1], [2], [3]. Businesses all over the world are increasingly using digital technology (both hardware and software) to improve the efficiency and effectiveness of their operation.

The application of HTML (Hyper Text Mark-up language) has made it very efficient for users to search for information on the web. The application of XML (eXtensible Mark-up Language) has enabled to develop business applications that are user friendly and platform independent [4]. XML is a system "enabling data on the Web or any large network to be readily swapped between any kind of device and any kind of application, regardless of what programming language the application was originally written in" [5: 55]. In the 1990s, the America Institute of Certified Public Accountants (AICPA), the U.S. Securities and Exchange Commission (SEC) and major international firms realised the potential of XML and started to back an international consortium to develop XBRL (eXtensible Business Reporting Language), which is an application of XML for use in business reporting. This effort includes the development of taxonomy for financial reporting under the US Generally Accepted Accounting Principles (GAAP).

Zhenkun Wang is with Nanjing University of Finance and Economics, China (e-mail: wangzhenkun@msn.com).

Simon S. Gao Simon S. Gao is with the School of Accounting, Financial Services and Law, Edinburgh Napier University, UK: also an affiliate professor at ESC-Rennes, France. (phone: 44-131-4554446; fax: 44-131-4554460; e-mail: s.gao@napier.ac.uk).

That taxonomy is intended to provide a set of XML-consistent tags that identify various items of financial and non-financial information relevant to business reporting. To tag (in an XML-based framework) every piece of information enables efficient and effective searching and reporting of such information and facilitates continuous monitoring and auditing of such information [6]. It has been widely acknowledged that XBRL is the technology that provides the financial community with a standards-based method to prepare, publish, extract and automatically exchange financial information. Using XBRL technology can obtain higher volume of specific information in shorter time period and avoid human errors [7].

Although this technology is still very young, the adoption of XBRL is remarkably fast across the world. Many countries have already made or are planning to make financial reporting using XBRL mandatory [9]. In the US more than 8,000 banks have been filing quarterly call reports in XBRL since October 2005 [2]. In Spain, over 400 banks are filing monthly financial statements in XBRL to the Bank of Spain [2]. In Belgium filing of accounts by companies to National Bank of Belgium switched to XBRL in April 2007 [8]. In Japan, the Tokyo Stock Exchange launched a pilot system in 2006 to demonstrate the usage of XBRL in financial reporting and in 2008 introduced this new technology to all financial bodies [10].

While XBRL and related issues (such as taxonomy, technical capability) have currently attracted much attention in the accounting press, extensive research into the quality of XBRL-based financial reports and the effect of XBRL on the efficiency and quality of financial reporting is very limited. It is still unclear what the potential impacts of XBRL are on the quality of financial information [11]. This research aims to fill this research gap by assessing the quality of XBRL-based financial reports and comparing the efficiency of XBRL and Non-XBRL financial reporting. Comparing 1000 XBRL-based and non-XBRL annual reports from US, China and South Korea, our study shows that XBRL-based financial reports have largely improved the quality of data. Although XBRL formatted financial reports do not show much advantage in the quality at the beginning, XBRL financial reports lately display a large improvement in the quality of data in almost all aspects. With the improved XBRL web data managing, presentation and analysis applications, XBRL formatted financial reports have a much better accessibility and are more accurate and better in timeliness.

World Academy of Science, Engineering and Technology
International Journal of Economics and Management Engineering
Vol:6, No:4, 2012

## II. PREVIOUS STUDIES AND FRAMEWORK

### A. XBRL Advantages

XBRL as a language for the electronic communication of business and financial data provides major benefits in the preparation, analysis and communication of business information. The literature has highlighted the potential benefits of XBRL in cost efficiency, automated exchange, great scope and reach of business information, frequency, timeliness, accuracy, reliability and accessibility of information (e.g., [12]; [13]; [14], [15]. According to [16], XBRL has the potential to support most of the goals of corporate governance stakeholders and to significantly improve governance. The literature has also acknowledged that these benefits can only be realised under satisfactory IT and social environments. It is argued that XBRL will increase transparency through the use of official taxonomies so the reported facts are clear and well documented for the users [12]. XBRL offers potential advantages for auditors such as automatic validation of calculated numbers or compliance with disclosure checklists. Automatic consumption of instance documents enhances the protection of market participants, reveals malpractices and mistakes of tax payers as well as secures the borrowing [16]. The use of XBRL combined with the other user readable formats provides the general public with the user-oriented publication of financial information [16].

XBRL has the potential to liberate the substance of financial data from its form, allowing users create new decision relevant knowledge by viewing and analyzing information in different and innovative ways, rather than being forced to start with a "one size fits all" statement. Fundamentally, data format choice shifts from preparer to user [16]. XBRL has evolved from a simple transmission protocol for financial information into a comprehensive set of technologies which supports data modelling (and more importantly, multidimensional data modelling with XBRL dimensions), financial data querying and setting of business rules (XBRL formulas), and the visualization of business information (online XBRL and XBRL rendering) [15], [16].

### B. Quality of Financial Reporting and Data

Quality characteristics of financial reports have been subjected to different interpretations. Redman suggests using current, comprehensive, easy-to-understand and accurate criteria to assess the quality of a good financial report [17]. US FASB Concepts Statement 2 "Qualitative Characteristics of Accounting Information" defines quality as a hierarchy of accounting qualities with relevance and reliability as the primary ones, and representational faithfulness, verifiability, neutrality, predictive value, feedback, comparability, consistency and timeliness as additional criteria. Some academics insist that quality is a transparency of financial reporting that represents the underlying business [18] or emphasise on consistency and comparability which enable the ability to analyze trends over a long period [19]. In the US, the Financial Analysts Federation used the timeliness, detail and clarity of information presented to evaluate four to five hundred

of financial statements each year. [20] proposes an assessment framework for identifying categories and dimensions of data quality and identifies 'intrinsic, accessibility, contextual and representational features' as the main categories of indications of the quality of data. These five categories are then divided into different dimensions. For example, intrinsic feature includes accuracy, objectivity, believability and reputation. They consider high-quality data as data that is fit for use by data consumers. Usefulness and usability are therefore considered to be the most important aspects of data quality. Table I provides the details of these categories and the dimensions.

TABLE I
DATA QUALITY CATEGORIES AND DIMENSIONS

| Data Quality Category | Intrinsic | Accessibility | Contextual | Representational |
|---|---|---|---|---|
| Data Quality Dimensions | Accuracy objectivity Believability Reputation | Accessibility Access Security | Relevancy Value-Added Timeliness Completeness Amount Of Data | Interpretability Ease Of Understanding Concise Representation Consistent Representation |

(source: Strong, Lee and Wang, 1997, p.104)

Using this framework Strader [27] assesses XBRL taxonomy components and concludes that the impact of XBRL on intrinsic data quality is limited because the verification system in XBRL is only based on mathematical calculations. With regard to the accessibility of data, quality is only related to the ease of access but not security. The author reveals that XBRL data provides more flexibility as XBRL definition link-base and taxonomy extension components are very extensible, which can be changed by users and regulators on requirement. However, the author fails to consider the application of XBRL will extender to the possibilities of tracking data input from the start of a transaction. In this paper, we use the framework of [20] to assess the quality of XBRL and non-XBRL financial reports in the context of financial reporting that is generally part of a company's data and information system.

## III. RESEARCH METHODS

In this research, a quantitative approach is used to assess the quality of financial reports prepared with XBRL and without XBRL from the user's perspective. First, criteria for the characteristic of quality of data are identified. Then, these criteria are used as a scoring index to score XBRL and non-XBRL financial reports for the same period and in the same region. Finally, these scores of XBRL and non-XBRL financial reports are evaluated by comparing data from three different countries. Using the criteria one of the authors who has good experience in dealing with both non-XBRL and XBRL financial reports marks all sampled financial reports to ensure the consistence in the assessment. Strong's et al. framework [20] is used as the main basis for our scoring scheme to assess the quality of financial reports. Each XBRL and Non-XBRL sample reports are marked under each data quality category alongside each data quality dimensions with a score from 1 to 10, where 1 indicates extremely poor quality and 10 indicates

World Academy of Science, Engineering and Technology
International Journal of Economics and Management Engineering
Vol:6, No:4, 2012

extremely good quality. Scores are then be aggregated in categories and used in specific dimensional comparison and analysis. We develop a quality analysis scoring model shown in Table II.

TABLE II
QUALITY ANALYSIS MARKING MODEL

| Modulus | Score | Sub-Score |
|---|---|---|
| Q0 (Overall) | | |
| Q1(Major Scores) | Q1a (Intrinsic) | Q1a1 (Accuracy) |
| | | Q1A2 (Objectivity) |
| | | Q1A3 (Believability) |
| | | Q1A4 (Reputation) |
| | Q1B (Accessibility) | Q2B1 (Accessibility) |
| | | Q2B2 (Access Security) |
| | Q1C (Contextual) | Q3C1 (Relevancy) |
| | | Q3C2 (Value-Added) |
| | | Q3C3 (Timeliness) |
| | | Q3C4 (Completeness) |
| | | Q3C5 (Amount Of Data) |
| | Q1D (Representational) | Q4D1 (Interpretability) |
| | | Q4D2 (Ease Of Understanding) |
| | | Q4D3 (Concise Representation) |
| | | Q4D4 (Consistent Representation) |
| Q2(Gap:Q0-Q1) | Others | |
| Q3(Errors) | | |

## IV. SAMPLE AND DATA

The samples of financial reports are collected based on the availability of XBRL formatted financial report data published. We use the XBRL data resources from the US EDGAR® online system, Chinese stock exchange system and Korean stock exchange system. The reason of using the US XBRL data is because US is the earliest country to suggest XBRL and file reports in XBRL. There are two groups of XBRL financial reports data in the EDGAR online system. One is the pioneer volunteer filing group in year 2007 which log XBRL formatted financial data from year 2004 to 2007. The other group is current official XBRL filing system which includes financial reports from year 2008 to now. The reason to use China's Shanghai Stock Exchange data is because China is also one of the earliest countries to file XBRL formatted financial reports and these reports are publically available today on their official website. The Shanghai Stock Exchange has two groups of XBRL formatted financial reports: the first mandatory financial reports dated year 2005 as an additional type of reports being available to the public in raw XML format, and the current integrated XBRL financial reports since year 2008 to now. South Korean DART (Data Analysis, Retrieval and Transfer System), which is the first to use graphic interface on XBRL web implications, is also one of the most complete XBRL formatted financial reports databases.

Both Chinese and Korean XBRL database can be freely accessed and downloaded by the public, however, the US EDGAR online system requires security log in. We initially collected 100 samples from each country as the first set of our XBRL formatted financial reports. Later on, the US EDGAR Online updated its XBRL taxonomy and filling system (2008-2010). Similarly, Shanghai Stock Exchange also

upgraded its web based XBRL data presentation engine (2008-2010). Accordingly, we collected additional 100 samples from each new set. The same size of non-XBRL formatted financial report samples over the same periods were collected in these three countries to ensure the comparability of these data. There are five groups of XBRL formatted financial reports and five groups of non-XBRL financial reports from the data resources. The first two groups of XBRL and non-XBRL financial report samples are from the US EDGAR online system. While the first group is pioneer volunteer XBRL filing, the second group is the official XBRL filing. The next two groups of samples are from Shanghai Stock Exchange system. The first XBRL group of these two is only available in raw XML format and the other group is in advanced web integrated format. The final group of data is from the Korean DART system where XBRL data has been continuously used each year. In total, 1000 financial reports under these five groups are individually marked under ISM and compared by region, time period and data quality categories.

## V. DATA ANALYSIS AND RESULTS

### A. USA

In the case of US, the first group of XBRL reports (US01) has a high quality than non-XBRL reports in general. While contextual feature in both cases are similar, the intrinsic, accessibility, representational features of XBRL-based financial reports are all slightly better than the non-XBRL reports. Both the XBRL and non-XBRL reports have very low quality scores with an average of about 5 out 10.

TABLE III
US01 MARKING RESULT – XBRL VS NON-XBRL

| Quality Category | Quality Dimensions | Min Xbrl | N-B | Max Xbrl | N-B | Average Xbrl | N-B | Overal1 Xbrl | N-B |
|---|---|---|---|---|---|---|---|---|---|
| Intrinsic | Accuracy | 3 | 3 | 9 | 7 | 4 | 5 | 6 | 6 |
| | Objectivity | 5 | 6 | 8 | 8 | 7 | 7 | | |
| | Believability | 5 | 6 | 7 | 9 | 6 | 7 | | |
| | Reputation | 4 | 4 | 8 | 8 | 8 | 6 | | |
| Accessibility | Accessibility | 6 | 2 | 8 | 6 | 7 | 4 | 6 | 5 |
| | Access Security | 3 | 3 | 7 | 8 | 5 | 6 | | |
| Contextual | Relevancy | 4 | 2 | 8 | 6 | 6 | 5 | 5 | 5 |
| | Value-Added | 2 | 3 | 7 | 7 | 4 | 4 | | |
| | Timeliness | 3 | 4 | 7 | 6 | 5 | 5 | | |
| | Completeness | 2 | 2 | 7 | 7 | 6 | 6 | | |
| | Amount of Data | 3 | 3 | 8 | 9 | 5 | 4 | | |
| Representational | Interpretability | 2 | 3 | 7 | 7 | 4 | 6 | 5 | 6 |
| | Ease of Understanding | 2 | 2 | 8 | 6 | 6 | 7 | | |
| | Concise Representation | 3 | 3 | 9 | 8 | 5 | 5 | | |
| | Consistent Representation | 4 | 4 | 9 | 9 | 5 | 6 | | |

Xbrl (XBRL) US-01, Type: Annual Report; Year: 2004-2007; Sample Size: 100; Format: Web XBRL; Type: Volunteer Filing. Resource: U.S. Securities & Exchange Commission, Link: http://216.241.101.197/viewer (EDGAR Online)
N-X (Non-XBRL) US-01, Type: Annual Report; Year: 2004-2007; Sample Size: 100; Format: PDF. Resource: U.S. Securities & Exchange Commission + Random Web, Link: http://216.241.101.197/viewer (EDGAR Online)

Table III presents the scores. The reason for this result is probably due to the fact that the first group of non-XBRL

World Academy of Science, Engineering and Technology
International Journal of Economics and Management Engineering
Vol:6, No:4, 2012

reports from the US EDGAR online system was automatically generated from the XBRL formatted financial reports.

The second group of financial reports (US02) from the US EDGAR online, however, are significantly better than the first group in both XBRL and non-XBRL formatted financial reports. The marking scores are presented in Table 4. The contextual and representational features of the reports in this group are much higher than those in the previous group presented in Table III.

TABLE IV
US02 MARKING RESULT – XBRL VS NON-XBRL

| Quality Category | Quality Dimensions | Min Xbrl N-B | | Max Xbrl N-B | | Average Xbrl N-B | | Overall Xbrl N-B | |
|---|---|---|---|---|---|---|---|---|---|
| Intrinsic | Accuracy | 7 | 4 | 10 | 9 | 9 | 8 | 8 | 7 |
| | Objectivity | 6 | 2 | 9 | 9 | 7 | 7 | | |
| | Believability | 6 | 3 | 8 | 8 | 8 | 6 | | |
| | Reputation | 5 | 5 | 8 | 9 | 7 | 7 | | |
| Accessibility | Accessibility | 5 | 2 | 8 | 8 | 6 | 5 | 7 | 6 |
| | Access Security | 6 | 3 | 7 | 9 | 8 | 7 | | |
| Contextual | Relevancy | 2 | 4 | 9 | 8 | 7 | 6 | 7 | 7 |
| | Value-Added | 3 | 5 | 8 | 8 | 5 | 7 | | |
| | Timeliness | 4 | 3 | 8 | 9 | 7 | 7 | | |
| | Completeness | 3 | 2 | 9 | 9 | 7 | 8 | | |
| | Amount of Data | 5 | 6 | 8 | 9 | 7 | 8 | | |
| Representational | Interpretability | 5 | 4 | 8 | 9 | 6 | 7 | 7 | 6 |
| | Ease of Understanding | 4 | 3 | 7 | 9 | 8 | 7 | | |
| | Concise Representation | 5 | 4 | 8 | 9 | 6 | 5 | | |
| | Consistent Representation | 5 | 4 | 8 | 8 | 8 | 6 | | |

Xbrl (XBRL) US-02, Type: Annual Report; Year: 2008-2009; Sample Size: 100; Format: Web XBRL; Type: Official XBRL Web Filing. Resource: U.S. Securities & Exchange Commission, Link: http://pro.edgar-online.com/expandedsearch.aspx (EDGAR Online Pro)
N-X (Non-XBRL) US-02, Type: Annual Report; Year: 2008-2009; Sample Size: 100; Format: PDF.
Resource: U.S. Securities & Exchange Commission + Random Web, Link: http://pro.edgar-online.com/expandedsearch.aspx (EDGAR Online Pro)

Yet, the non-XBRL reports have lower quality in general than the XBRL reports, with only contextual quality features are indifference. The result indicates that with the development of XBRL technology and application software, financial reports in XBRL start to show advantages over non-XBRL formatted financial reports. The top three features that XBRL formatted financial reports show high quality than the non-XBRL formatted financial reports include 'accuracy', 'timeliness' and 'accessibility'. In addition, the presentational features are currently improved in XBRL web applications. iMatrix software in the EDGAR online system can now present and compare different XBRL formatted financial reports all graphically, which improves the interpretability and ease of understanding dimensions.

When comparing the XBRL formatted financial reports from different year groups, we can see a substantial difference on the level of quality represented. As shown in Figure 1, the first group of the US XBRL financial reports has poor contextual and representational quality (below 5). After two years, with the

development XBRL taxonomy, Dragon Tag and iMatrix XBRL application software, these weaknesses has been addressed and the contextual and representational quality of XBRL formatted financial reports have considerably improved.

The reasons that the first group of XBRL formatted financial reports representing a poor quality may include: 1) XBRL taxonomy and related XBRL application software were still under developed at the time; 2) The first group of XBRL filing was voluntary at the time, which had some impact on the content and accuracy of filing; 3) Most of XBRL financial reports in the first group were directly mapped from previous non-XBRL formatted groups, then pdf formatted reports were re-produced from these XBRL reports that caused a poor content in the amount of information included and the accuracy of numeric data. XBRL formatted financial reports in the second group were all seriously validated by XBRL numeric logic software to ensure the accuracy of data. Also, the convenient web iMatrix financial analysis software definitely improved the usability of XBRL formatted data in usability and presentation aspects such as ease of understanding and concise representation.
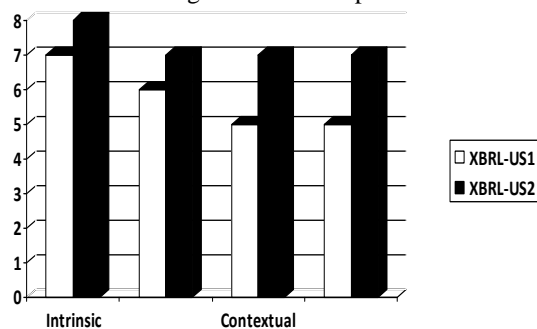


Fig. 1 A comparison of the quality of XBRL reports between US01 and US02

*B. China*

In the case of China, when comparing the year 2005 XBRL and non-XBRL reports, the XBRL formatted reports have considerably lower quality than those non-XBRL formatted reports in contextual and representation as shown in Table 5. Figure 2 shows that the average score of XBRL reports is only around 4 out of 10, whereas the average score for non-XBRL reports is around 6 out of 10.

Comparing the details of quality scores, we can see that this group of XBRL reports have lower security and poorer interpretability than non-XBRL reports. The main reasons for this are: 1) This group of XBRL data were simply mapped directly from current financial reports when the Chinese Taxonomy was not ready and XBRL mapping software was still under developed; 2) Companies that did these mapping only included very limited amount of information from the original reports; 3) There was no XBRL web integrated presentational software available at the time.

TABLE V
CH01 MARKING RESULT – XBRL VS NON-XBRL

| Quality Category | Quality Dimensions | Min Xbrl N-B | | Max Xbrl N-B | | Average Xbrl N-B | | Overall Xbrl N-B | |
|---|---|---|---|---|---|---|---|---|---|
| Intrinsic | Accuracy | 7 | 3 | 9 | 7 | 8 | 5 | 7 | 6 |
| | Objectivity | 7 | 4 | 8 | 9 | 7 | 8 | | |

World Academy of Science, Engineering and Technology
International Journal of Economics and Management Engineering
Vol:6, No:4, 2012

| | | Min Xbrl | N-B | Max Xbrl | N-B | Average Xbrl | N-B | Overall Xbrl | N-B |
|---|---|---|---|---|---|---|---|---|---|
| | Believability | 4 | 3 | 9 | 8 | 5 | 6 | | |
| | Reputation | 6 | 4 | 8 | 9 | 7 | 6 | | |
| Accessibility | Accessibility | 2 | 3 | 7 | 7 | 7 | 5 | 5 | 6 |
| | Access Security | 4 | 6 | 6 | 8 | 3 | 7 | | |
| Contextual | Relevancy | 2 | 4 | 6 | 9 | 4 | 8 | | |
| | Value-Added | 1 | 5 | 4 | 8 | 3 | 7 | 3 | 7 |
| | Timeliness | 2 | 3 | 5 | 9 | 3 | 6 | | |
| | Completeness | 1 | 4 | 4 | 9 | 2 | 7 | | |
| | Amount of Data | 1 | 5 | 3 | 8 | 2 | 7 | | |
| Representational | Interpretability | 2 | 5 | 5 | 8 | 3 | 6 | | |
| | Ease of Understanding | 1 | 6 | 4 | 9 | 2 | 7 | | |
| | Concise Representation | 2 | 2 | 6 | 8 | 3 | 6 | 4 | 6 |
| | Consistent Representation | 3 | 2 | 8 | 6 | 6 | 4 | | |

Xbrl (XBRL) CN-01 Type: Annual Report; Year: 2005; Pool Size: 827, Sample Size: 100; Format: Raw XML.
Resource: Chinese Shanghai Stock Exchange, Link: http://www.sse.com.cn/sseportal/webapp/datapresent/SSEXBRLFileListAct
N-X (Non-XBRL) CN-11, Type: Annual Report; Year: 2005; Pool Size: 1213; Filtered Sample Size: 100; Format: PDF.
Resource: Shenzhen Stock Exchange, Web Link: http://disclosure.szse.cn/m/search0425.jsp
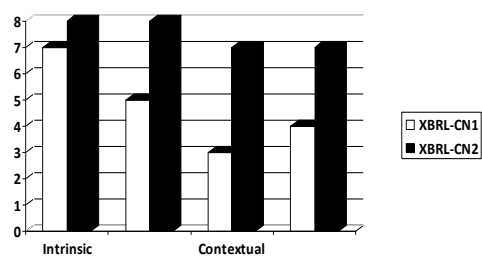


Fig. 2 A comparison of the quality of XBRL reports between CN01 and CN02

Table VI shows the quality of the second group of XBRL data in the Shanghai Exchange system has been greatly improved. After a two-year period of delaying in the development, The Shanghai Stock Exchange system finally developed a new XBRL application interface for all their financial reports filings.

TABLE VI
CH02 MARKING RESULT – XBRL VS NON-XBRL

| Quality Category | Quality Dimensions | Min Xbrl | N-B | Max Xbrl | N-B | Average Xbrl | N-B | Overall Xbrl | N-B |
|---|---|---|---|---|---|---|---|---|---|
| Intrinsic | Accuracy | 6 | 5 | 10 | 9 | 9 | 8 | | |
| | Objectivity | 5 | 3 | 8 | 8 | 7 | 7 | 8 | 8 |
| | Believability | 5 | 7 | 9 | 10 | 9 | 9 | | |
| | Reputation | 6 | 5 | 8 | 9 | 8 | 8 | | |
| Accessibility | Accessibility | 5 | 5 | 8 | 8 | 9 | 6 | 8 | 7 |
| | Access Security | 4 | 4 | 9 | 9 | 7 | 8 | | |
| Contextual | Relevancy | 5 | 6 | 9 | 9 | 6 | 7 | | |
| | Value-Added | 5 | 3 | 8 | 10 | 8 | 8 | 7 | 8 |
| | Timeliness | 4 | 5 | 9 | 9 | 8 | 8 | | |
| | Completeness | 3 | 6 | 9 | 9 | 7 | 8 | | |
| | Amount of Data | 5 | 6 | 9 | 9 | 7 | 8 | | |
| Representational | Interpretability | 3 | 3 | 8 | 7 | 6 | 5 | | |
| | Ease of Understanding | 4 | 5 | 9 | 8 | 7 | 7 | 7 | 6 |
| | Concise Representation | 4 | 2 | 8 | 7 | 5 | 5 | | |
| | Consistent Representation | 6 | 3 | 9 | 8 | 7 | 6 | | |

Xbrl (XBRL) CN-02, Type: Annual Report; Year: 2008 & 2009; Pool Size: 864 + 882; Sample Size: 100; Format: Web XBRL Interface; Added Functions: Comparison (max5), PDF Source Link, Feedback.
Resource: Chinese Shanghai Stock Exchange, Link: http://listxbrl.sse.com.cn/ssexbrl/index.htm
N-X (Non-XBRL) CN-12, Type: Annual Report, Year: 2008 & 2009; Sample Size: 100; Formats: PDF; Resource: Chinese Shanghai Stock Exchange, Link:http://www.sse.com.cn/sseportal/webapp/datapresent/SSEPeriodicPDF?COMPANY_CODE=600016&REPORT YEAR=2008&REPORTTYPE=n.

From the table, we can see that the XBRL formatted financial reports showing very high quality in the intrinsic and accessibility features, with contextual slightly lower than the non-XBRL formatted reports and representation slightly higher.The overall score of XBRL reports is around 7 to 8 out of 10, whereas the non-XBRL reports is around 7 out 10, which have little differences. However, the score of random samples has much lower accessibility than XBRL reports and non-XBRL reports from the same source, with presentation scoring the highest in all three types of reports. Comparing in detailed scoring, we can see that the XBRL and non-XBRL reports in this group have added a huge amount of useful information, which is almost equal to the random samples. On the other hand, random samples have lower accuracy score and believability than the other two types of reports. The biggest disadvantage for the random samples is not as easy to access as the XBRL data which is all directly available and searchable on Shanghai Stock Exchange website. The main reason for this change is majorly because the advance of XBRL taxonomy and development of XBRL web interface applications. However, those XBRL formatted financial reports are still generated from traditional pdf reports. XBRL format has improved the data accessibility and representational features. Still those data are relying on the non-XBRL formatted data, instead of creating in XBRL format from the start, which can only increase the accountant's workload. A good aspect of this group of XBRL financial reports in the Shanghai Stock Exchange system is that they include the descriptive information and categorise them inside the XBRL reports. The new web preventative application made those more convenient for viewing and comparing. Added analysis tools on the web page improved the usability of these data and provided a better XBRL user experience. Comparing XBRL formatted financial reports from the Shanghai Stock Exchange system in two periods we can see that the Accessibility, Contextual and Representational quality features have all been greatly improved in the latter group of XBRL formatted reports. The average quality score of the first group of XBRL reports is four out of ten, whereas the average quality score of the second group of CN XBRL reports is around six to seven out of ten. The CN01 group XBRL data shows weak in contextual and presentational aspects; For the CN02 group, XBRL data have good quality in almost all aspects. In more detailed quality scores, the CN02 XBRL data improve accessibility score on the aspect of security and contextual score on the aspects of completely, value added data and amount of information. In addition, the presentational features are improved mainly because of better interpretability. The main reason for this improvement was mainly because of the much improved web interface system. To be precise, the first group of XBRL financial reports was only like a display on the official website system, but without actual usability. On the other hand, the second group of XBRL does really take the advantage of what XBRL can offer. With integrated web financial data managing, presenting and analysis software, the quality of these financial reports as well as the usability of these financial reports have been greatly improved. Again, it has indicated that the improvement of XBRL financial reports' quality is deeply relying on the development of XBRL taxonomy and XBRL application software.

World Academy of Science, Engineering and Technology
International Journal of Economics and Management Engineering
Vol:6, No:4, 2012

*C. South Korea*

South Korea has only one official XBRL data system. The XBRL formatted financial reports collected from DART database has shown better quality in Intrinsic and Accessibility features as shown in Table VII.

TABLE VIII
KR MARKING RESULT – XBRL VS NON-XBRL

| Quality Category | Quality Dimensions | Min Xbrl | Min N-B | Max Xbrl | Max N-B | Average Xbrl | Average N-B | Overall Xbrl | Overall N-B |
|---|---|---|---|---|---|---|---|---|---|
| Intrinsic | Accuracy | 5 | 4 | 10 | 7 | 8 | 6 | 7 | 5 |
| | Objectivity | 5 | 4 | 8 | 6 | 6 | 5 | | |
| | Believability | 7 | 3 | 9 | 6 | 6 | 4 | | |
| | Reputation | 4 | 4 | 8 | 7 | 7 | 5 | | |
| Accessibility | Accessibility | 5 | 2 | 9 | 7 | 8 | 4 | 6 | 4 |
| | Access Security | 5 | 3 | 8 | 6 | 4 | 4 | | |
| Contextual | Relevancy | 3 | 5 | 9 | 8 | 7 | 7 | 6 | 7 |
| | Value-Added | 2 | 4 | 5 | 7 | 4 | 6 | | |
| | Timeliness | 3 | 4 | 7 | 8 | 7 | 6 | | |
| | Completeness | 4 | 3 | 8 | 9 | 6 | 7 | | |
| | Amount of Data | 3 | 7 | 7 | 9 | 6 | 8 | | |
| Representational | Interpretability | 5 | 4 | 8 | 8 | 6 | 6 | 6 | 6 |
| | Ease of Understanding | 4 | 5 | 8 | 8 | 5 | 6 | | |
| | Concise Representation | 2 | 3 | 8 | 9 | 8 | 7 | | |
| | Consistent Representation | 3 | 3 | 7 | 7 | 8 | 5 | | |

Xbrl (XBRL) Type: Annual Report; Year: 2007-2008; Pool Size: 15019; Sample Size: 100; Format: Web XBRL Interface. Resource: South Korean DART (Data Analysis, Retrieval and Transfer) System, Link: http://englishdart.fss.or.kr/dsbd001/main.do; Ref: http://xbrl.kosdaq.com/?lang=english
N-X (Non-XBRL) Type: Annual Report; Year: 2007; Sample Size: 100, Format: PDF.
Resource: Korean Exchange, Link: http://eng.krx.co.kr + Random Web.

In detailed quality scoring, the non-XBRL financial reports are week in intrinsic features mainly because of the lower believability and objectivity. The general accessibility scores of non-XBRL reports are low in security and detailed accessibility. Nevertheless, the non-XBRL financial reports are still slightly better than XBRL formatted reports in Contextual for completeness and amount of data.

In all, the quality of South Korean's XBRL and non-XBRL are much more consistent than the US and China, especially on the XBRL side. This may due to Korean developed a good website XBRL managing system from the beginning (although later than the US and China), and used a mixed approach on filing these financial reports. However, the disadvantage of Korean's financial report filing is that they are lagged behind the development of XBRL comparing with the US and China. The general quality score of Korean XBRL formatted reports of 2009 are much improved than 2007, but not as good as those in American and Chinese database.

## VI. CONCLUSIONS

Using a scoring system, this paper provides a comparative assessment of the quality of data between XBRL formatted financial reports and non-XBRL financial reports. It shows a fast increasing trend in the improvement of the quality of data of XBRL formatted financial reports. Although XBRL formatted financial reports do not show much advantage in the quality at the beginning, XBRL financial reports lately display a large improvement in the quality of data in almost all aspects. With the later XBRL web data managing, presentation and analysis applications, XBRL formatted financial reports have a much better accessibility, are more accurate and better in timeliness and retain a consistent format.

REFERENCES

[1] R. F. Premuroso, and S. Bhattacharya, "Do early and voluntary filers of financial information in XBRL format signal superior corporate governance and operating performance?", *International Journal of Accounting Information Systems,* Vol. 9 No. 1, 2008, pp. 1-20,

[2] E. Bonsón, V. Cortijo, and T. Escobar, "Towards the global adoption of XBRL using International Financial Reporting Standards (IFRS)", *International Journal of Accounting Information Systems*, Vol. 10 No. 1, 2009, pp. 46-60.

[3] P. Robert, "XBRL awareness in auditing: a sleeping giant?" *Managerial Auditing Journal*, Vol. 18 No. 9, 2003, pp. 732.

[4] B. J. Jansena, and P. R. Molinab, "The effectiveness of Web search engines for retrieving relevant ecommerce links," *Information Processing & Management*, Vol. 42, No. 4, July 2006, pp.1075-1098.

[5] G. Hill, "Slouching tiger, hidden dragon," *E-Company*, May 2001, pp.52-62.

[6] H. Du, and S. Roohani, "Meeting challenges and expectations of continuous auditing in the context of independent audits of financial statements", *International Journal of Auditing,* Vol. 11, No. 2, 2007, pp. 133-146.

[7] L. Matherne, and Z. Cottin, "XBRL: A technology standard to reduce time, cut costs, and enable better analysis for tax preparers," *The Tax Exeuctive,* Vol, 52, 2001, p.68.

[8] E. Bonsón, V. Cortijo, and T. Escobar, "The role of XBRL in enhanced business reporting (EBR)," *Journal of Emerging Technologies in Accounting*, Vol. 5, No. 1, December 2008, pp. 161-173.

[9] E. Bonsón, V. Cortijo, and T. Escobar, "A delphi investigation to explain the voluntary adoption of XBRL," *The International Journal of Digital Accounting Research,* Vol. 9, 2009, pp. 193-205.

[10] R. D. Plumlee, and M. A. Plumlee, "Assurance on XBRL for financial reporting," *Accounting Horizons,* Vol. 22 No. 3, 2008, pp. 353-368.

[11] D. Valentinetti, and M. A. Rea, "Adopting XBRL in Italy: Early evidence of fit between Italian GAAP Taxonomy and current reporting practices of non-listed companies," *The International Journal of Digital Accounting Research*, Vol. 11, 2011 pp. 45-67.

[12] R. Debreceny, S. Farewell, M. Piechocki, C. Felden, and A. Gräning, "Does it add up? Early evidence on the data quality of XBRL filings to the SEC," *Journal of Accounting and Public Policy,* Vol.29, No.3, 2010, pp. 296-306.

[13] E. K. Ghani, F. Laswad, and S. Tooley, "Digital Reporting Formats: Users' Perceptions, Preferences and Performances," *The International Journal of Digital Accounting Research*, Vol.9, July 2009, pp.45-98.

[14] V. Beattie, and K. Pratt, "Issues concerning web-based business reporting: an analysis of the views of interested parties," *The British Accounting Review,* Vol. 35 No. 2, 2003, pp.155-187.

[15] S. Roohani, Z. Xianming, E. A. Capozzoli, and B. Lamberton, "Analysis of XBRL literature: A decade of progress and puzzle," *The International Journal of Digital Accounting Research*, Vol.10, November 2010, pp. 131-147.

[16] M. Alles, and M. Piechocki, **"**Will XBRL improve corporate governance?: A framework for enhancing governance decision making using interactive data," *International Journal of Accounting Information Systems* 2010.

[17] T.C. Redman, *Data Quality: Management and Technology*, Bantam Books, New York, NY, 1992.

[18] R. W. Holthausen, "Accounting standards, financial reporting outcomes, and enforcement," *Journal of Accounting Research*, Vol.47, No.2, May 2009, pp.447–458.

[19] J. E. Boritz, and W. G. No, "Assurance on XBRL-related documents: The case of United Technologies Corporation," *Journal of Information Systems*, Vol. 23 No. 2, 2009, pp.49-78.

[20] D. M. Strong, Y. W. Lee, and R. W. Wang, "10 potholes in the road to information quality," *Computer,* Vol. 30, No. 8, 1997, pp.38-46.

[21] T. J. Strader, "XBRL capabilities and limitations," *The CPA Journal*, Vol. 77, No. 12, 2007, pp. 68-71.