XBRL: Consequences to Financial Reporting, Data Analysis, Decision Support, and others

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Abstract

The objective of the paper is to discuss how XBRL has enhanced the usefulness of financial reporting, data analysis, and decision support. We examine four qualitative characteristics of XBRL usefulness in regards to financial reporting. The four qualitative characteristics that make XBRL tagged financial reporting useful are relevance, faithful representation, comparability and consistency, and understandability. We also identify six future XBRL evolutionary trendss affecting financial reporting, data analysis, and decision support. These evolutionary trendss include improvement in data control and support for dynamic reporting, standardization of taxonomy through evolution, improved transparency of footnote disclosures through formalization, adoption of XBRL-GL for Internal Reporting, tagging of pre-XBRL data, and focus on data analysis in education.

Keywords: XBRL, Financial Reporting, Data Analysis, Decision Support, Information Exchange

Paper Outline

I. Introduction

Financial information is used to communicate a company's financial position to internal and external users for decision making. Today, financial information is mainly distributed electronically and consumed by humans. However, the current value of financial statements in the electronic format is of limited value beyond distribution. The benefit of having financial information in electronic format is that machines can assist humans in performing data retrieval and data analysis for decision making.

Although machines can easily read the data, understanding the underlying data and its relationship can be difficult without an agreed upon standardized language and structure. The ability of computers or machines to assist humans analyzing the data for decision making purposes is the true value of financial information in electronic format. The capability of computers to interpret and understand the data will make the underlying financial information more useful.   However, currently for computers to understand financial information, the data must be tagged in a machine readable language and structured.

XBRL (eXtensible Business Reporting Language) is a financial reporting markup language derived from XML (eXtensible Markup Language). The markup language is used to tag or label information within the financial statement. The XBRL tags are used to identify and describe the items on the face of the financial statements and related footnote disclosures.   XBRL tags are classified according to a taxonomy (e.g. US GAAP Taxonomy) which defines and structures how each tagged line item in the financial statements relates to a structure of reporting concepts. For example, the tag <cash> would be defined under the taxonomy as a current asset which would fall under the asset section of the balance sheet. Financial reports filed in XBRL format were mandated in 2009 by the SEC (Securities and Exchange Commission) and required a phase in period for public companies to comply. XBRL promises to revolutionize financial business reporting. By 2011, all public companies regulated by the SEC would have filed financial reports (10Q, 10K, transition reports, 8K, 6K, Restatements, and Securities Act registration statements) in XBRL in addition to their normal filings. XBRL and related technologies will ultimately enable machines to read, understand, retrieve, and manipulate financial statement data.

According to (FASB 2006), the objective of financial reporting is to provide useful financial information to its intended users. The FASB (Financial Accounting Standards Board) qualitatively describes financial information as useful if the information is relevant, faithfully represented, comparable and consistent, and understandable. The intentions of the SEC in mandating XBRL for public companies is to make financial statement information available in a format that will improve its usefulness to its users[1]. Furthermore, according to XBRL proponents, XBRL will provide greater transparency of accounting and financial data to investors, analysts, government and other external stakeholders. The nexus between the SEC's intention of XBRL and the objective of financial reporting by FASB is to ultimately make financial information more useful to its users.

The remainder of the paper is organized as follows. In the next section, we examine how XBRL improves the usefulness of financial statement information in four qualitative characteristics. These four qualitative characteristics that make XBRL tagged financial reporting useful are: 1. Relevance; 2. Faithful Representation; 3. Comparability and Consistency; and 4. Understandability. In section III, we identify six future XBRL evolutionary trends affecting financial reporting, data analysis, and decision support: 1. Improvement in data control and support for dynamic reporting; 2. Standardization of taxonomy through evolution; 3. Improve transparency of footnote disclosures through formalization; 4. Adoption of XBRL-GL for Internal Reporting; 5. Tagging of pre-XBRL data; and 6. Focus on data analysis in education. Finally, section 4 concludes the paper.

II. XBRL Enhances the Usefulness of Financial Statement Information

Relevance

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[1] 17 CFR Parts 229, 230, 232, 239, 240 and 249 (http://www.sec.gov/rules/final/2009/33-9002.pdf)

Volumes of accounting data and related materials are generated on a periodic basis for financial reporting purposes. An economic decision should be based on complete and relevant information. However, the volume of accounting information makes it a difficult task to retrieve complete and relevant data needed for data analysis and decision support. The use of the internet as a distribution vehicle of accounting data such as financial reports makes it easier to acquire data but more challenging to acquire complete and relevant data. An example scenario, a user of a company's financial statements would like to look up the inventory balance and the related footnote disclosures regarding the method of inventory accounting. This search can take a consider amount of effort because the user would have to find the inventory balance on the face of the financial statements and then look for all the related disclosures and footnotes in another part of the document or webpage. This would even be more challenging if they needed data from multiple periods or multiple companies. These challenges make searching for complete and relevant information very difficult, time consuming, and increases the propensity of making decisions based on incomplete or incorrect information.

The discretionary structure of the financial statement reports can motivate management to hide or disguise company financial information through the use of complicated disclosures or abstract presentation due to agency theory. In agency theory, management has the incentive to present the best financial performance to increaser compensation and retention of employment (Jensen and Meckling 1976). XBRL will improve the transparency of financial information by further standardizing the structure and content of the financial statements. XBRL enables machines to automate the search and retrieval of complete and relevant information within financial statements. Machines that understand the context of the underlying data can provide the user with the inventory balance and all associated/related disclosures and footnotes regardless of the financial statement report format. This will allow users to focus effort on the results from data analysis rather than on data collection process itself.

Using enhanced metadata technology such as XBRL can have a useful impact on decision making. For example, in (Hodge, Kennedy et al. 2004), investigated whether using XBRL enhanced search engines can assist users in acquiring and integrating financial information for making investment decisions. They that XBRL enhanced search engines users increased the likelihood of acquiring relevant information andt made different investment decisions. This indicates that the use of machines can help improve the transparency of financial information. In a similar finding (Hannon 2002), XBRL has the potential to influence a user's judgment and decisions because of the ability to acquire and process relevant information.

Faithful Representation

Currently, XBRL guidelines require only that XBRL filings faithfully reflect paper filings. Although XBRL filing requirements are at its infancy, accuracy and integrity of reporting should still be a priority. As the reliance on XBRL filings and availability of XBRL analysis software become more prevalent, there will be a migration from using traditional static financial reports on the internet to using interactive data. Hence, users will want some form of assurance on the accuracy of XBRL filings and its compliance with technical specifications (Plumlee and Plumlee 2008). In a recent empirical study, evidence shows that there were errors between the 10Ks and XBRL filings with the SEC (Bartley, Chen et al. 2010). If users are going to use and rely on the data tagged in XBRL to make material economic decisions, they will demand some level of assurance that the line items in the financial statements and related footnote disclosures are properly tagged (Assurance) and are from an reliable source (Authentication).

External auditors will most likely not be providing assurance on the XBRL filings as an additional audit service. The auditors may document on their work papers that they tied the XBRL filings with the paper filing of the financial statements and they are in compliance with technical specification. For authentication, an intermediary entity will have to authenticate the data retrieved from the company's website or from the SEC repository to validate that it is indeed coming from a verified source **(Figure 1)**. Authentication will prevent the problem of spoofing of the data source and provide assurance on the integrity of the data received. The intermediary entity can come in the form of a certification authority. Perhaps the SEC or a tird party (e.g. Verisign) can serve as this function. All financial data transmitted from the source will have to be digitally signed to verify the data came from its source, date and time, and was not tampered on its transmission. This intermediary entity will serve the same purpose as an issuer of digital signatures or website authentication certificates on the internet. Currently, SEC requires companies to post their XBRL filings on their websites in addition to the posting on the SEC repository.

Comparability and Consistency

The Internet opens up the opportunity that the same static financial reports can be posted in multiple places by different people at different times. There is a problem with this scenario, one user may find information at one location that is different from another location but the information references to the same financial report. For example, User A is looking for the cash balance of Company XYZ on the internet for 12/31/10 on June 12, 2011 and finds the original filed 10K on Website A. On May 3, 2011, the Company restates its cash balance due to a prior material misstatement. User B on June 12, 2011 uses the cash balance on the restated financial reports from the company's website. Therefore, User A and User B can be making the same economic decision but based on two different inconsistent and incomparable amounts at the time of analysis. This scenario can occur even if the user went on the SEC website to acquire data due to the archaic disclosure structure of the Edgar Database. The problem is caused by the static stale nature of content on the internet. This means that if information is updated, the static information would not all be updated and those relying on the outdated information may make incorrect decisions based on inconsistent or incomparable data.

Currently, crossectional data analysis is prohibitively labor intensive, time consuming difficult to compare, and error prone due to reporting formats by different companies, industries, and countries. In crossectional analysis, the user will want to compare oranges with oranges and apples with apples. Under the traditional reporting paradigm, comparability and consistency of financial statement accounts is difficult because of the discretionary format of reports. However, peer analysis is important to create a measurement benchmark. A user can utilize the aggregated industry average to compare to an individual company to see how that company did relative to their industry competitors. For example, the user may want to investigate whether a company's sales are out of line in comparison with similar companies of the same industry. XBRL will eliminate inconsistency and incomparability issues. Using XBRL filings, users can be sure of using comparable accounts with different companies due to the taxonomy structure which specifically defines the accounts and relationships between accounts.

Understandability

The non-accountant making use and analyzing accounting data may not know what each line item account and footnote disclosure means in the financial statement. Often footnote disclosures in the financial statements are important elements and ignored by ordinary users in the decision making process. Some may ignore this additional information because they do not know that it exists, where

they are located, or if they are related to what they are looking for. Even more advanced users, due to the diversity of international accounting standards, may be confused about the application of accounting to specific accounts on the financial statements. Professional financial analysts understand the significance of disclosures and footnotes because they often look at them before they actually look at the financial statements (Callaghan, Savage et al. 2002).

XBRL filings are structured using a taxonomy which defines the accounts on the financial statements with accounting concepts and identifies the relationship between accounts and footnote disclosures. These relationships and concepts can be linked to FASB Codification for additional information. FASB Codification linkage can be used to further the users understanding of the financial statement accounts and related disclosures. This can be of great use for non-accountants. For example, if the user would like more details explaining the financial statement accounts or disclosure then the software may retrieve the related FASB Codification to help the user understand the line item. XBRL can be the cornerstone technology that puts nonprofessional users on par with professional financial analysts. XBRL technology will enhance the user knowledge and assure the use of relevant data.

III. Consequence of XBRL

Due to further thinking and consideration, we revisit and advance the five axioms proposed originally by (Vasarhelyi, Alles et al. 2010). These original five axioms include: 1. Tagging will facilitate continuous reporting; 2. Tagging will create its own semantics; 3. Tagging will lead to greater granularity of reporting data; 4. Pressure on the standardization of financial reporting; 5. Creating compatibility between tagging among countries and sectors. We advance these five axioms with six future XBRL (evolutionary trends???) evolutionary trendss affecting financial reporting, data analysis, and decision support.

Data Control and Dynamic Reporting

There is much financial information available today and users are often bombarded with data overload.   This situation will get worst as more frequent or continuous reporting becomes the norm. A user should have the ability to extract only the relevant data they need to perform their financial data analysis for decision making. The traditional business reporting model is to provide users with a cluster of information and let them decide how to disseminate what they receive. For example, if a user wants to find out how much cash a company has, he/she will have to request the whole financial statement from the company. The user then manually extracts the cash balance from the financial statement. XBRL financial reporting will enable users to specifically request relevant data (cash balance and/or cash related accounts) and be given in return exactly what they requested. Financial data tagged in XBRL allows a computer to recognize and automates the extraction of the specific relevant data on the financial statements. XBRL aids in providing its users with a mechanism to better control data.

Prior to XBRL, a user had to manually pull or request data from a source. The source can be a company's website, SEC Edgar database, proprietary vendor of data, or a miscellaneous website. Users manually retrieve and extract data from the source to be analyzed on spreadsheet reports. These reports generated are static and are not updated automatically. In the real time economy, information is updated on a frequent or continuous basis. As a result, most reports are outdated as soon as they print. Furthermore, the manual process of retrieving data makes the generation of reports a clumsy, labor, and time intensive task. Under the XBRL paradigm, relevant data can be automatically pulled or

pushed from the data source using software. This allows for automated dynamic reporting. Perhaps these dynamic reports may manifest into the form of dashboards. These dynamic reports will automatically reflect the latest timely information.

Standardization of Taxonomy through Evolution

Standardization of concepts and taxonomies can be a daunting task since there are many companies and different industries. Furthermore, there are companies that have global businesses which follows alternative XBRL taxonomies. However, to truly have an open information exchange there needs to be a universal standard taxonomy or dictionary. This feature will become increasingly important as business become more global in operations. At the infancy of mandating XBRL filings by public companies, it is expected that there will be many extensions added to the XBRL taxonomy. As XBRL filings mature, extensions representing new concepts will shrink. Companies and their industries will agree on taxonomy that encompasses most common business conceptsl. However, it would be unwise to say that all business concepts can be represented by a standard taxonomy since the format of financial reporting is discretionary and is always adapting to the needs or usefulness of its users. But taxonomy standardization is ultimately necessary to support comparability and consistency which are qualitative attribute of usefulness in financial reporting. Hence, new companies may be forced to adapt their reporting to the standard taxonomy.

Although there may be concerns about too many unique company specific extensions to agree upon going forward, the advancement in convergence or standardization of the XBRL taxonomy will be pushed by the accounting software or enterprise resource planning systems (ERP) developers. They will champion the development of a unified standardized taxonomy for the financial reporting domain. For example, the developers will have a standard template for their chart of accounts and companies will have to adapt their financial reporting requirements to those standard template. However, this will not preclude the specialty needs of individual companies. The developers will still support individual companies that need company specific extensions. These new extension will just be added to the universal XBRL taxonomy and will be available to other companies for use. As time goes by, most business concepts will be represented by the XBRL taxonomy and thus less extensions will be needed going forward. Furthermore, the push by developers for converging a standard taxonomy may have an indirect effect on helping unify the difference between international accounting taxonomies. This is cause by the fact that many companies are operating globally and rely on the same developers for their accounting information systems. The unification of taxonomies will improve comparability and consistence and hence the usefulness of financial reporting for end users.

Improve transparency of Footnote Disclosures through Formalization

Footnotes disclosures describe and elaborate on the line items in the financial statements. Currently, the SEC has mandated a progressive phase in period for detailed level tagging of footnote disclosures in the financial statements. In the first phase, only blocking of the footnotes is required. In the subsequent period, the tagging of tables, quantitative amounts, and significant accounting policies is required. However, due to the varying nature of the disclosure text, this can add minor value to the user of the Footnotes disclosures for data analysis. For the tagged disclosures to become more useful to users, the variations in disclosures should be accounted for. In addition, the tagging of disclosure should be neutral as to the text in the disclosure. Hence, formalization of disclosures will be necessary. For example, different company specific variations of the inventory method disclosure can receive different

tags. This will allow the machine to understand what the disclosure objectively means in addition to the values that are required to be separately tagged in the disclosure.

Currently, the US GAAP Taxonomy may not include company-specific financial statement disclosure items. Hence, to support variations of disclosures, there needs to be a separate sister taxonomy to the U.S. GAAP Taxonomy. The tagging of numerous variations of disclosures will enable automation in retrieval of relevant and useful information. The greater refinement of the disclosure being tagged enhances the usability and understandability by machines for processing information. For example, a user would like to find out all companies that use lower of cost or market for valuing inventory, using the cost basis of first in first out, and were not required to comply with U.S. GAAP for a specific reason. The simple blocking of the disclosure can limit the granularity of information within the disclosure and hence its value. Having tags specifically for multiple variations of the disclosure will enhance the usefulness to the end user. Furthermore, the formalization of disclosures will allow for more transparency and refinement of concepts by clearly defining the meaning of footnote disclosures.

Adoption of XBRL-GL for Internal Reporting

Companies generally have two options available to them to comply with the SEC XBRL filing mandate. A company can attach an XBRLdisclosure, generated from the numbers on their filings onto their traditional filings or they can have one built automatically out of their ERPs that comply with the SEC XBRL filing requirements. Compliance with the SEC mandate using a paper-to-XBRL approach is a non-value added compliance cost to the firm. However, the use of a built in process within their accounting information system may optimize the value of XBRL for internal reporting purposes as well. XBRL comes in two flavors, XBRL-FR (eXtensible Business Reporting Language – Financial Reporting) and XBRL-GL (eXtensible Business Reporting Language – Global Ledger). XBRL-FR is XBRL for external financial reporting purposes and mandated by the SEC. XBRL-GL is XBRL for internal reporting purposes. A public company is not mandated to implement XBRL-GL in their accounting information systems. However, XBRL-GL will enable the usefulness of internal financial reporting by allowing management to automate the extraction of relevant accounting data in real time from data warehouses in an efficient, effective, timely, and accurate manner.

In today's real time economy, it is important for management to make decisions and judgments based on timely and relevant information. Developments such as Supply Chain Management, Business Process Reengineering, Activity-Based Management, and the Balanced Scorecard have driven the demand for development of real-time information gathering (Alles et al. 2002). XBRL-GL can be an invaluable tool to make the real time information gathering process more efficient. However, since there is no regulatory requirement by the SEC or other government agency to implement XBRL-GL into their accounting systems, the key driver for the implementation of XBRL-GL will be the demand for it by businesses. As a result, management will have to consider whether the benefits of implementing XBRL-GL into their accounting information systems will outweigh the initial setup cost. Management should consider the usefulness and cost savings in internal reporting. Furthermore, the implementation of XBRL-GL can automatically generate XBRL-FR reports filings to boot.

The value and usefulness of XBRL-GL can also extend to the auditors of the company. The process of obtaining the accounting data to perform analytical procedures is often inefficient, time consuming, and a frustrating task. It is often called the request and wait game between the auditor and the client. This process is both costly to the client and to the auditors. Audit support from the client takes the client's staff away from their daily duties and the down time of auditors while waiting for

client support is usually chargeable to the client. With XBRL-GL, auditors can extract relevant accounting data directly from the client's accounting system when they need it to perform analytical procedures without the need for client assistance or intervention given that XBRL-GL taxonomy will define accounts and their relationships. The potential realized savings by audit firms can be passed down to their client by limiting the number of chargeable hours dedicated to an engagement and allowing some of the audit work to be performed remotely from the auditor's office resulting in better allocation of human resources

Tagging of Pre-XBRL Data

XBRL tagging of financial statements is now mandated going forward by the SEC. However, there is an enormous amount of financial reporting information from the past that has not been tagged in XBRL. Historical data is typically useful in data analytics to analyze a company's financial performance over time. This causes a problem under the current scenario since there is no regulatory mandate requiring past financial statements to be tagged. Many companies would be hesitant to go backwards and tagged the historical data due to its volume and cost. In ([Bovee, Kogan et al. 2005](#)), they suggest the use of a Financial Reporting and Auditing Agent with Net Knowledge (FRAANK).   FRAANK is an intelligent agent that uses intelligent parsing to extract financial information on the web.   The manual conversion of past financial statements would be costly and challenging. The prototype FRAANK was able to automatically convert plain text financial statements on the web into XBRL tagged format with good accuracy. FRAANK is also able to compute financial ratios by obtaining other non financial information from the web such as stock quotes and forecasted earnings. Perhaps this role of tagging historical financial reports belongs to the SEC since it would be a burden for companies. There is a social benefit of tagging prior financial statements for future private or public research relying on historical data. However, this process will not occur for a while before any significant formalization of the U.S. GAAP XBRL Taxonomy.

Focus on Data Analysis in Education

Although it is important to learn the fundamentals of accounting, it is becoming increasingly important for accounting students to complement that knowledge with the understanding of XBRL, XBRL taxonomy, and its use for financial reporting, data analysis, and decision support. The need for technical savvy and data minded accountants will increase as accounting and auditing technology improves. With technology improving and the increased automation of data retrieval and data analysis work, the industry will require less man power and more thinking power or professional judgment. Accounting programs at Universities will have to address this issue by providing advance courses that show students how to interpret data analysis and how to collaborate information from outside the accounting information system to make professional judgments. Although most students will never have to learn to program in XBRL, there will be a need to learn how to use software to extract and use accounting and financial data in XBRL. The future main focus of financial reporting and analysis will be how to use, manipulate, and interpret data.

IV. Conclusion

This is an important period in accounting because financial reporting is being revolutionized by technology and resulting regulation. In 2009, the SEC has mandated all public companies to issue XBRL filing in addition to their traditional filings. As a foreseen consequence, XBRL enables machine to aid

users in data retrieval, data analysis, and decision making.   The ability of machines to assist or automate data retrieval and data analysis can make the decision making process more efficient and effective. XBRL is progressively making data analysis much easier by eliminating the error prone and resource consuming manual data preparation and allowing the humans and machine to make decision judgments. XBRL has also unforeseen consequences such as potentially pressing for the development of a universal standardized U.S. GAAP taxonomy and helping converge accounting information across different countries through evolution. The current tagging of the financial statements in XBRL-FR at the end of the financial reporting process is illogical and provides little value besides facilitating transmission and compliance with regulation. XML tagging should start at the transaction level and fluently and automatically flow into the sub-ledgers enabling XBRL- GL. XBRL tagging should begin in the accounting process and not at the end of the financial statements creation process.

The contribution of this paper to the XBRL literature is twofold. First, the paper discusses the usefulness of XBRL in relations to financial reporting with five qualitative characteristics. These four qualitative characteristics that make XBRL tagged financial reports useful are:
1. Relevance
2. Faithful Representation
3. Comparability and Consistency
4. Understandability

Second, we identify six future XBRL evolutionary trends affecting financial reporting, data analysis, and decision support:
1. Improvement in data control and support for dynamic reporting
2. Standardization of taxonomy through evolution
3. Improve transparency of footnote disclosures through formalization
4. Adoption of XBRL-GL for Internal Reporting
5. Tagging of pre-XBRL data
6. Focus on data analysis in education.

Figure 1 – Authentication
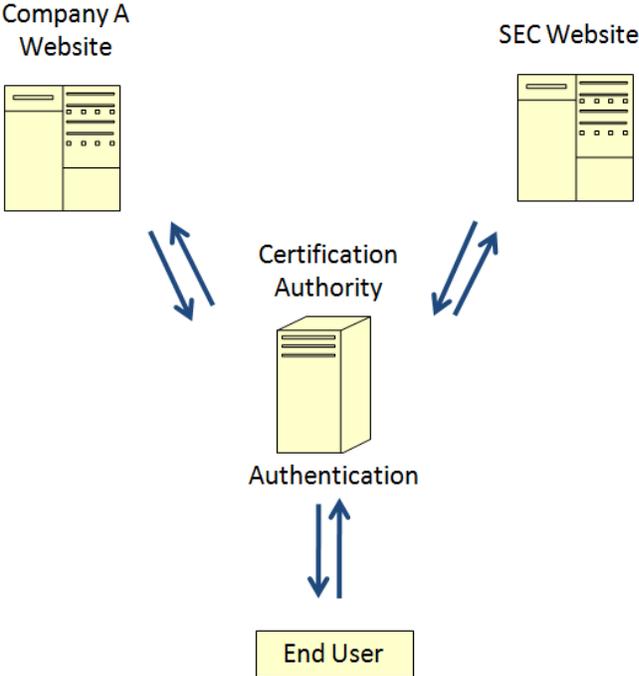
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