Research on Implementation of the Financial Statements Based on XBRL Linkbase

Yin YANG\textsuperscript{1,a}, Jing XIA\textsuperscript{2,b,*}, Zong-xin GONG\textsuperscript{1,c} and Tong XU\textsuperscript{1,d}

\textsuperscript{1}School of Accounting, Wuhan Textile University, Wuhan, China
\textsuperscript{2}Finance Department, Wuhan Textile University, Wuhan, China
\textsuperscript{a}cs_yangyin@hust.edu.cn, \textsuperscript{b}callidora2015@163.com, \textsuperscript{c}gzx199561@163.com, \textsuperscript{d}xssunt123@gmail.com

*Corresponding author

Keywords: Financial Statements, XBRL Linkbase, XBRL Taxonomy.

Abstract. With companies becoming bigger and stronger and being global, as well as company’s businesses being cross-regional and cross-industry, the preparation of the financial statements becomes more and more complex. The emergence of XBRL will change the above situation and impact the preparation of the financial statements. Every company can use the elements of XBRL’s common classification criteria to sort out (financial information), but needs to extend the element which does not exist in the common classification criteria, then building the Linkbase of extension elements is an important issue that enterprises facing. First, this paper introduces the concepts and theories of XBRL. Second, this paper gives the preparation process of XBRL-based financial statements. Third, this paper detailedly analyzes the actualization of XBRL taxonomy extension element Linkbase module in the implementation process and briefly describes the establishment and usage of XBRL classification criterions, the actualization of modules, such as the acquisition of company financial data module, the generation of basic financial statements module and XBRL instance documents’ reporting and analysis and so on. Finally, the paper proposes a XBRL-based Linkbase, and then analyzes the financial statements that based on XBRL Linkbase. Through the research and implementation of XBRL Linkbase, companies can improve the efficiency of the preparation of the financial statements, easily extend elements according to their company’s needs in real time, and provide financial statement analysis and decision-making information combined with XBRL data.

Introduction

The majority of companies finish the financial statements by manual, which leads to cost a lot of time and energy on the implementation of the financial statements. The ERP system that generates the financial statements is not identical between enterprises, coupled with different data format and contents of financial statements required by government departments, agencies and organizations, accountants and other units and individuals, which has added enterprise’s cost on re-implementation to the date of financial statements. And after various organizations and departments receive the related data of the financial statements, they also need to input and analyze these data, in order to get the needed information, which needs further processing to the same data. Meanwhile, these repeated and complex implementation processes will inevitably generate some human error, which is a threat to the reliability of date. With the continuous development and innovation of computer technology and Internet technology, this provides a new choice of the generation of financial statements: XBRL technology is born to solve the above problems [1].

XBRL classification criterions usually include a schema file and five linkbase files [2]. Schema file is to define the concept and attribute classification criterions, and linkbase files are to define the relationship between the concepts of model files. XBRL through the use of professional classification
criterions and hackling elements of general classification criterions and implementation of creating extension element classification criterions, so as to achieve the subsidiaries classification criterions and submission of the element extension. This creating extension element classification criterions implementation and submit the most important key problem is implementation of extension elements linkbase. This article discusses the implementation based on XBRL linkbase. Therefore, the existing XBRL is mainly used in the disclosure of financial information rather than financial statement analysis; this paper will state in detailed how to use XBRL linkbase to implement preparation of financial statements.

The method to realize the XBRL in financial statements

With the content of financial statements and other financial reporting is more and more, the form of that is more and more complex, as well as the continuous expansion of business scale and business volume incessant increasing, leading to a large amount of data redundancy in the ERP system. At the same time, different institutions and personnel require different forms of report format (PDF, HTML, and WORD). In addition, the financial statements do not have a unified storage format, which leads to extending the time of the exchange and retrieval between different divisions, which has brought the adverse factors to the method for electronic [3]. The implementation process based on XBRL financial statements are shown in Fig. 1.

![Figure 1. The implementation process based on XBRL financial statements.](image-url)

Because the XBRL has unified format to each data, each data has a unique tag for its own. These tags not only contain the data content, as well as include the data of some internal news and links with other data. In this method there is an integrated database specially used to store data of financial reports, which is different from multiple databases doing their own work, financial information is stored in a single XBRL financial statements, the data flow is always bi-directional, which greatly facilitate the enterprise’s financial data collecting, sorting and release [4].

Enterprises ERP system data and subsidiaries date are as merge data sources in the financial statements generated module, the enterprise can input merge data sources through the form of the interface inputting [5]. It also can use the corresponding software to quickly obtain the corresponding financial data or Excel files to directly obtain data, which makes data source into the integrated database. Based on CAS and IFRS classification criterions, according to the subsidiaries financial data to determine the classification criterions elements and extension classification criterions (based on the enterprise linkbase, establishing the accounting subjects and classification criterions and its
corresponding relation with extension elements, finally realizes the financial statement data based on XBRL.

**The implementation of XBRL linkbase**

The most important problem of the implementation of XBRL linkbase is general classification criterions of the matched elements cannot be used for, which needs the enterprise to create extension elements [6]. XBRL consists of three kinds of files, including an instance document, classification criterions and technical specifications. Classification criterions consist of a model file and linkbase. Linkbase is divided into five parts, including the definition, display, calculation, labels, and reference linkbase files.

XBRL technical specification is the sum of XBRL, which defines the various types of professional term, standardizes the XBRL document structure and illustrates how to establish classification criterions and instance documents. XBRL instance documents are in accordance with certain XBRL classification criterions to produce financial instance or business data files. It is the data entity of the enterprise financial statements, including the specific values of elements defined in the model file of classification criterions, and some defined date background information.

Model files define elements and elements of the various attributes that the report file may contain. The definition of elements is completed in the classification files, and the relationship between the element and elements are described in the linkbase. Linkbase files include five kinds: definition linkase, labels linkbase, display linkbase, calculation linkbase and reference linkbase. In classification criterions, linkbase files are optional.

Definition linkbase are used to define the various relationships between elements, mainly including the four basic types relationship: general and special relationship, primitive name and alias relationship, elements and regulations relationship, similarity and tuples relationship; Displaying the interrelation of linkbase definition when shown, hierarchical relationships of structure of element and element, as well as the order relationships, so that the software can be displayed the code in the form of reading; the name that should be shown in the display, realizing by the label link. Therefore, the element and its display name mapping in the tag linkbase. Label linkbase can link the definition element in the schema file with name that people are easier to understand. Calculation linkbase mainly describe the relationship between element and numerical calculation of element, it is a calculated relationship link that has been set, which is added and summary relationship. That can be defined “custom link role” to expand the function of calculation link linkbase. Reference linkbase describes an element reference file, pointing out related citation index for the element, which can be reference for the report users. These reference relations describe the different referenced resources types. These five linkbase can be divided into the following two types according to the different describe objects, resources linkbase and relational linkbase. Thereinto, definition linkbase and the reference linkbase are resources linkbase, which describes corresponding of the elements and described information in the linkbase. Other three linkbase are relational linkbase, describing the relationship between the element and element.

**The financial statements implementation based on XBRL Linkbase**

The financial statements implementation process which is based on XBRL Linkbase can be actualized by four sub-functions: the manufacturing of XBRL taxonomy standard, non-generic taxonomy extension element Linkbase module, acquiring of financial date, producing of financial statement. Specific implementation process is showed by Fig. 2.

**1. The manufacturing of XBRL taxonomy standard**

According to the financial date form entrepreneur and using professional elements of professional taxonomy standard, XBRL taxonomy standard whose manufacturing and using module based on CAS taxonomy standard and IFRS taxonomy standard, provides theories for extension operator to check the generic taxonomy standard and create the taxonomy standard of extension elements.
2. Checking of Generic taxonomy standard and actualization of non-generic taxonomy extension element Linkbase module

Checking of Generic taxonomy standard and actualization of non-generic taxonomy extension element Linkbase module can provide 2 functions: checking elements of generic taxonomy standards and creating extension elements taxonomy standards. There are 3 processes to actualize the checking of generic elements standard: analyzing the structure of financial statement, supporting elements from financial statement and mapping taxonomy standard. The creation of extension elements taxonomy standard can be actualized by confirming the attribute of extension elements, elements label and identification of Linkbase, including definition Linkbase, display Linkbase, label Linkbase, calculation Linkbase, reference Linkbase.

![Diagram of XBRL taxonomy standards and extension elements](image)

Figure 2. The financial statements implementation process based on XBRL Linkbase.

3. The acquiring of financial date

Module of company financial data can summarize ERP system date and date form subsidiary and Branch Company. In addition to, the whole system can directly retrieve some information from data interface. There are three manners to acquire company financial date: manual input, making Excel document by financial operator and acquiring form financial data system.

The manner of manually input. This method will not update the ERP system. It just manually records some into relevant software then all the information will be transport into the formal of XBRL date. This manner has low cost but wouldn’t exert technical advantages of XBRL besides it will cause mistakes to reduce the accuracy.

The manner of XBRL embed format converter. It can transport some existed financial statement of EXCEL or WORD format documents into XBRL format documents and don’t make mistakes and lots date. Also it can guarantee the accuracy. From now on this is most popular using module.

The manner of XBRL embeds Adapter. This integrate Adapter is added into the financial or ERP system. It handles information and financial statement directed by XBRL stander, in the meantime it can output document of XBRL format. But this pattern needs enterprise has the new updated software
for ERP system and XBRL embed Adapter. In the every process of dealing with business, it can fetch and convert all the XBRL data then produce stander XBRL document. This manner can exert all the advantages of XBRL system even though has high cost. Obviously it can offer an opportunity for the conversation between all kinds of information. Above all this is a best manner for actualize of XBRL technology.

In view of above, the enterprise should be directed by realistic situation because of these three manners have different advantages and flaws. In order to push the development of XBRL application, the software-developing company should be more positive to attend design which can match XBRL system and add the XBRL reporting-function module into existed EPR software which can make XBRL financial statement document.

4. The actualization of financial statement

Having acquired ERP financial data and emerging company financial data, the module of actualization of financial statement can confirm taxonomy stander and extension taxonomy stander elements, then build the correspondence relationship to the caption of account and fill the financial statement, finally actualize the data recording and transporting XBRL financial statement through the analyzing XBRL data and some relevant financial theory knowledge furthermore display data financial statement.

Summary

As a based on the Extensible Markup Language (XML), XBRL has been used in the over around the word since 1999. Through research of this paper there are two conclusions: First, the financial statements based on the XBRL Linkbase build up the comparability of the financial data. The taxonomy stander of financial based on XBRL Linkbase can give own unique remark to every single data which not only includes the data message but also has inner information and relationship about other data. It is convenient to fetch data and dig information for information collectors or user in addition to make analysis, decision. All of these functions can help government to accurately analyze macro economy, industry and enterprise.

Second, propose the actualization of process frame based on XBRL Linkbase. This has four parts: the producing of XBRL taxonomy stander and using, the checking of Generic taxonomy standard elements and actualization of Non-Generic extension elements Linkbase, researching about , module of acquiring company financial data, which actualize three methods about acquiring data: manual directly record data, import function about EXCEL financial statement document and directly sampling financial data from data interface. The module of actualization financial statement, through XBRL software, combines theory of Linkbase with theory of financial statement and achieve financial statement base on XBRL Linkbase.

Acknowledgement

This research was financially supported by the 2015 Humanities and Social Science Project of Education Department of Hubei Province (15Q100).

References

