Research on the Improvement Path of Financial Report Based on XBRL

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Abstract. Cloud computing drives the exponential growth of data scale, forming a "big data phenomenon". There is huge commercial value behind big data, which requires the use of deep mining and machine intelligence technologies to discover and apply. In the third wave of informatization, the application of big data technology in the field of XBRL financial reporting has a strong necessity and feasibility. The article first conducts extensive surveys and statistics on the problems in the application of XBRL from the perspective of the capital market, and conducts a visual analysis. Then, the article introduces the IASB's accounting information quality characteristics and China's accounting information quality requirements. Finally, it discusses how to use big data technology to improve the quality of XBRL financial report presentation information, such as deep learning, knowledge calculation, visualization, classification prediction, outliers, etc.

1. Introduction
XBRL has a built-in verification mechanism, provides an information verification and analysis platform, enables computers to automatically read financial reports, and reduces information processing errors. XBRL can process data under cross-language and cross-standards, and solves the problem that multinational companies need to re-report due to different languages and accounting standards[1]. XBRL is a milestone in the history of accounting information development and has an epoch-making effect. With the popularization and promotion of advanced technologies such as cloud computing, big data, and mobile communications, the process of global economic integration has become faster and faster, the national boundaries of enterprises have become increasingly blurred, and cross-border economic exchanges have become more frequent. XBRL International is a global organization with more than 600 countries and regions joining the organization. China officially joined the organization in 2008. XBRL is widely used in the world's major stock exchanges, banks and financial institutions, listed companies and accounting firms. In my country, listed companies and some large and medium-sized enterprises have begun to compile XBRL-based financial reports, and XBRL financial reports of listed companies can be easily accessed on the XBRL information service display platforms of the Shenzhen Stock Exchange and the Shanghai Stock Exchange. XBRL has become unstoppable. How to improve the quality of XBRL financial report submission has become an important research topic of XBRL.
2. The problems and causes of XBRL financial report application

The problems and causes of XBRL financial report application is the capital market that is not paying enough attention to XBRL financial report submission. XBRL has been widely promoted and applied internationally, and XBRL has a significant effect on improving the comparability and transparency of corporate accounting information.[2] However, the XBRL instance documents disclosed by listed companies have not been fully recognized in Chinese law. When an enterprise submits a financial report in PDF format, it must also submit an additional financial report in XBRL format.[3] The financial report in XBRL format is only a supplement to the financial report in PDF format. However, the U.S. capital market pays great attention to XBRL, and the amount of XBRL data of the U.S. Securities and Exchange Commission has shown a massive increase each year. Governments, enterprises, intermediary agencies and other enterprise external users can easily obtain XBRL financial reports and other data from the XBRL service platform to meet the needs of management decision-making. Listed companies are also very happy to upload their XBRL financial reports and other information to the XBRL platform. The capital market and the listed companies have formed a good interactive exchange.

In order to understand the implementation status of XBRL financial report disclosure in the Greater Bay Area, members of the research team conducted a questionnaire survey on 60 securities investors and 40 securities brokers in the business departments of securities companies such as Dongguan Securities, Guotai Junan, Guangfa Securities, and CITIC Securities, etc. The basic information of the interviewees is shown in Table 1. From Table 1, the sample number of Dongguan Securities is 26, among which 16 are securities investors and 10 are securities brokers; Guotai Junan’s sample number is 25, of which 15 are securities investors and 10 are securities brokers; The sample number of GF Securities is 24, of which 14 are securities investors and 10 are securities brokers; The sample number of CITIC Securities is 25, of which 15 are securities investors and 10 are securities brokers.

Table 1. Basic information of interviewees.

| Securities Company         | Ordinary investors (number of people) | Securities Brokers (number of people) | Total (number of people) |
|---------------------------|--------------------------------------|---------------------------------------|--------------------------|
| Dongguan Securities       | 16                                   | 10                                    | 26                       |
| Guotai Junan Securities   | 15                                   | 10                                    | 25                       |
| GF Securities             | 14                                   | 10                                    | 24                       |
| CITIC Securities          | 15                                   | 10                                    | 25                       |
| Total (number of people)  | 60                                   | 40                                    | 100                      |

In order to investigate the capital market’s attention to the XBRL financial report submission, the project survey questionnaire has designed four contents, namely the standards for the preparation of XBRL financial reports, the contents of the preparation of XBRL financial reports, the impact of XBRL financial information on investment decisions, and XBRL financials, the impact of information on stock prices. The statistical results are shown in Table 2 and Figure 1.

Table 2. The degree of attention paid by the capital market to XBRL financial reports.

| Item                                | Ordinary investor | Securities brokers |
|-------------------------------------|-------------------|--------------------|
|                                     | Very Familiar     | Generally Familiar | Unfamiliar         | Very Familiar | Generally Familiar | Unfamiliar |
| XBRL financial report preparation standard | 0.00%             | 4.67%              | 93.33%            | 3.50%        | 7.50%              | 15.00%     | 3.1%     | 77.50%     |
| XBRL financial report preparation content | 3.33%             | 9.00%              | 81.67%            | 5.00%        | 12.50%             | 40.00%     | 19.00%   | 47.50%     |
Figure 1. The degree of attention paid by the capital market to XBRL financial reports.

It can be seen from Table 2 that for the standardized documents for the preparation of XBRL financial reports, the survey results of investors show that the number of familiar samples is 0, accounting for 0%, and the number of familiar samples is 4, accounting for 6.67%; the unfamiliar sample size is 56, accounting for 93.33%. The survey results of securities brokers show that there are 3 familiar samples, accounting for 7.50%, the generally familiar samples are 6, accounting for 15.00%, and the unfamiliar samples are 31, accounting for 75.00%. According to this set of statistics, it can be seen that both investors and securities brokers have not mastered the rules and techniques of XBRL financial report preparation well. Regarding the content of the XBRL financial report, the survey results of investors showed that there are 2 very familiar investors, accounting for 3.33%, 9 generally familiar investors, accounting for 15.00%, and 49 unfamiliar investors, accounting for 81.67%. The survey results of securities brokers showed that the number of familiar samples was 5, accounting for 12.50%, the number of familiar samples was 16, accounting for 40.00%, and the number of unfamiliar samples was 19, accounting for 47.50%. According to this set of statistical data, it can be seen that most investors are not familiar with the content of XBRL financial reports, and securities brokers are more familiar with the content of XBRL financial reports.

Through the analysis of table 3 and figure 2, from the perspective of the impact of XBRL financial information on stock prices, the survey results of investors show that there is 1 sample with a significant impact, accounting for 1.67%, and the number of samples with general impact is 9, accounting for 15.00%; The sample size that has no effect is 50, accounting for 83.33%. The survey results of securities brokers showed that there were 12 samples with great influence, accounting for 30.00%, the number of samples with general influence was 22, accounting for 55.00%; the number of samples without influence was 6, accounting for 15.00%. It can be found from the survey data that most investors believe that XBRL financial information has little effect on stock prices. However, most securities brokers believe that XBRL financial information has a certain impact on stock prices. From the perspective of the influence of XBRL financial information on investment decision-making, the survey results of investors show that there are 2 samples with great influence, accounting for 3.33%, and the number of samples with general influence is 12, accounting for 15.00%; the sample size that has no effect is 46, accounting for 81.67%. The survey results of securities brokers show that: the number of samples with great impact is 10, accounting for 25.00%, the number of samples with general impact is 25, accounting for 62.50%; the number of samples without impact is 5, accounting
for Is 12.50%. It can be seen that investors currently have a low degree of utilization of XBRL financial reports, and they rarely consider XBRL financial information when making investment decisions.

Table 3. The impact of XBRL financial information on the capital market.

| Item                                                   | Ordinary investor | Securities brokers |
|--------------------------------------------------------|-------------------|--------------------|
|                                                        | Great  | General | little | Great  | General | little |
| The impact of XBRL financial information on stock prices | 1  1.67% | 9  15.00% | 50  83.33% | 12  30.00% | 22  55.00% | 6  15.00% |
| The impact of XBRL financial information on investment decisions | 2  3.33% | 12  15.00% | 46  81.67% | 10  25.00% | 25  62.50% | 5  12.50% |
| Total (number of people)                                | 60     |         |        | 40     |         |        |

Figure 2. The impact of XBRL financial information on the capital market.

In summary, XBRL financial information has not yet achieved the expected effect in the domestic capital market. The investors and the securities brokers did not really excavate and use XBRL financial information. I believe that the advantages of XBRL in the capital market require a certain amount of time to accumulate and experience.

3. Suggestions on improving the XBRL financial report reporting model

3.1. Improve the quality of XBRL financial report submission.
Since the legal status of XBRL financial reports has not been truly established, investors have to use PDF financial reports when making investment decisions. XBRL financial reports are only used as a supplementary reference, leading the capital market to pay less attention to XBRL financial reports[4].
XBRL uses structured markup to enable computers to automatically identify financial reports and connect enterprises, taxation departments, finance departments, accounting firms and other relevant departments to realize the interconnection of information, make data transmission smoother, and make data analysis more convenient, to achieve cross-industry, cross-enterprise horizontal comparison and cross-period vertical comparison. Under XBRL, non-financial information can also be marked, and investors can obtain XBRL financial information and XBRL non-financial information in real time, thereby improving the accuracy of corporate decision-making. Therefore, while enterprises improve the quality of information submission, government departments must also give XBRL financial reports corresponding legal status.

3.2. Using XBRL technology to strengthen the submission and management of non-financial information.

While the XBRL financial report is disclosed, non-financial information such as production, logistics, and human resource management of the company can also be automatically marked, so that the computer can automatically identify non-financial information, reduce the risk of data entry, and achieve real-time financial and non-financial information. The release enables the integrated management of the financial business, improves the management and control efficiency of investors, equity holders and other stakeholders, and helps them to conduct data mining and analysis more conveniently and timely.

4. Summary and outlook

As my country's capital market is becoming more and more perfect, the disclosure model of corporate financial reports should also change. XBRL technology based on big data is a magic weapon to solve the problems of traditional financial report disclosure mode[6]. The article found through research that the capital market reacted indifferently to XBRL work, and proposed countermeasures in order to provide a useful reference for the improvement of XBRL financial report reporting under big data from the capital market dimension.

[Fund Project] 2018 Guangdong Province Undergraduate College Teaching Quality and Teaching Reform Construction Project(Project Number: The Official Letter of Department of Education of Guangdong Province [2018] No. 179); The Key Scientific Research Project of Guangdong University of Science and Technology in 2019 (Project No.: GKY-2019KYZD-11); The Key Scientific Research Projects of Guangdong University of Science and Technology in 2020 (Project Number: GKY-2020KYZDW-2).

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