

The Application of Big Data Technology in Improving the Quality of Financial Accounting Information

Ting Li^a

Department of accounting, Xiamen University, Xiamen, China

^a19890408085@163.com

Abstract

The continuous development of the digital economy has led to the continuous expansion of the scale of enterprise business data, and the traditional financial accounting information processing method faces new requirements in terms of data accuracy, information timeliness and risk identification. With functions such as data integration, intelligent processing, dynamic analysis and abnormal recognition, big data technology provides new technical conditions for improving the quality of financial accounting information. The article analyses the application of big data technology in the quality improvement of financial accounting information, sorts out the role mechanism of big data technology that affects the formation of accounting information through the integration of business and financial data, intelligent analysis and tracking the whole process, and proposes to promote the integration of business and financial data, build an intelligent analysis system, and improve digital According to the implementation path of security mechanism, strengthening the cultivation of composite financial accounting talents, etc., improve the accuracy, timeliness and reliability of financial accounting information, and provide reference for the digital transformation of enterprise financial management.

Keywords

Big Data Technology; Financial Accounting; Information Quality; Business and Financial Integration; Intelligent Analysis.

1. Introduction

With the deepening of the digital operation of enterprises, procurement, production, sales, capital and other business activities continue to generate a large number of structured and unstructured data, and the data sources and information processing needs faced by financial accounting work have also changed. The traditional financial management model mainly relies on manual entry, voucher audit, account reconciliation and report summary. With the expansion of business scale and the increasing complexity of business activities, it is easy to have insufficient information processing efficiency, poor data connection and untimely abnormal identification. Big data technology can open up the data connection between the financial system and the business system, and change the formation and use of financial information with the help of automatic verification, dynamic analysis and abnormal warning. Based on this, it is of practical significance to improve the financial data governance system and improve the efficiency of accounting information application by exploring how big data technology plays a role in improving the quality of financial accounting information and building a corresponding implementation path in combination with the problems in the actual operation of the enterprise.

2. The Role Mechanism of Big Data Technology Applied to Improve the Quality of Financial Accounting Information

In the digital economic environment, the financial data and business data of enterprises continue to grow, and the formation of financial accounting information gradually changes from manual collection and accounting to digitalisation and intelligence. Big data refers to a complex collection of data characterized by a massive scale, rapid growth, diverse structures, and high value, the processing of which exceeds the capabilities of traditional data management tools^[1-2]. The core of modern big data technology lies in efficient storage, intelligent analysis, and real-time processing to extract the potential value of data. Big data technology can integrate financial system, business system and external business data, open up the data association of different business links, reduce data loss caused by information dispersion, and improve the integrity of accounting information. In the process of data processing, data cleaning, automatic verification and abnormal identification can reduce the errors caused by repeated entry, data omission and human calculation, and improve the accuracy of information. Relying on real-time data collection and dynamic analysis, enterprises can grasp the changes of indicators such as income, costs, funds and accounts receivable in a timely manner, and shorten the time interval between business occurrence and financial information feedback. In the information verification link, the system enhances the traceability of information by associating business records, accounting vouchers and financial results, and using the whole process data traceability. As shown in Table 1, big data technology mainly improves the quality of financial accounting information through data integration, intelligent processing, dynamic analysis and process tracking, forming a chain of action that runs through data collection, processing, analysis and verification, and providing data support for financial supervision and internal audit.

Table 1. The mechanism of big data technology to improve the quality of financial accounting information

Link in the translation process	Mode of technical application	Impacts on the quality of accounting information
Data integration	Aggregate data from financial systems, business systems and external operational data to build linked data chains	Improve the completeness of accounting information
Intelligent processing	Process data via technologies including data cleansing, automatic verification and anomaly identification	Reduce errors caused by manual entry, omissions and calculation, and enhance information accuracy
Dynamic analysis	Collect and analyse real-time indicators such as revenue, costs, capital and accounts receivable	Shorten the time lag between business occurrence and financial information feedback, and improve information timeliness
Process tracing	Establish data correlations among business records, accounting vouchers and financial outcomes	Strengthen the traceability of accounting information and provide support for audit supervision
Comprehensive effect	Embed data technologies into the whole process of generation, processing and verification of accounting information	Advance the quality control of financial and accounting information from manual management to data-driven governance

3. The Actual Problems Facing the Quality of Financial Accounting Information of Enterprises at Present

3.1. Manual Processing Depends on the Accuracy of Accounting Information

In traditional financial accounting work, there are a large number of tasks of data entry, voucher audit, account reconciliation and statement summary, which are highly repetitive. When the number of business in the enterprise is small, manual processing can maintain good controllability. As the scale of the business expands, the pressure of data processing will gradually increase^[3-4]. When personnel process a large number of similar data for a long time, it is easy to have numerical input errors, subject classification errors or data omissions. Complex business may also involve multiple systems and multiple data sources, requiring financial personnel to repeatedly check business records and accounting vouchers. The more manual operation links, the more difficult it is to control the differences in the information processing process. Although some enterprises have used financial software, the software mainly undertakes basic accounting functions. Data analysis and abnormal identification still rely on personnel experience, so there is a certain distance between technical tools and actual management needs. Manual processing is not without professional value, but for work with a high degree of standardisation and a large amount of data, the proportion of repeated operations should be reduced through technical means, so as to provide a more stable data processing environment for the quality of accounting information.

3.2. Information Processing Lag Reduces the Use Value of Financial Data

Financial accounting information has a strong time limit attribute. Enterprise managers usually need to understand income changes, capital status, cost expenditure and business operation based on business data. If financial information can only be summarised monthly, quarterly or even longer cycles, some business changes may not be detected by the financial department for a long time. Traditional financial work often takes after-the-process accounting as the main task, and the data can only form a relatively complete information after going through processes such as business occurrence, voucher collation, audit, settlement and report preparation. This processing mode is applicable to standardised financial reports, but there are certain limitations when enterprises need to carry out daily business monitoring. For example, if the sales volume of a product suddenly drops, if the relevant data needs to wait until the periodic report is formed, the response time of managers to market changes will be affected. In the big data environment, the work object of the financial department has gradually expanded from simple historical data to dynamic business data. It is necessary to change the way of information generation and shorten the time distance between business data generation and financial information feedback.

3.3. Insufficient Risk Identification Ability Affects the Reliability of Information

The quality of financial accounting information not only involves the accuracy of the data, but also whether abnormal information can be found in time. There are a large number of transactions with small amounts but high frequency in the daily operation of enterprises. If only manual spot checks are relied on, it is difficult to continuously analyse all data. Traditional financial supervision usually conducts audits based on established rules and experience, and the ability to identify abnormal relationships formed across departments and systems is relatively limited. For example, sudden changes in purchase prices, abnormally frequent transactions of the same supplier, centralised expense reimbursement, etc. may not be obvious when observing a certain data alone, but after linking the data of different periods and different business entities, the abnormal characteristics may be clearer. Big data technology can use historical data to establish an analysis model. By setting dimensions such as amount, frequency, time and business relationship, abnormal data can be screened and financial personnel can be

provided with early warning information, financial supervision can be expanded from single data inspection to related data analysis, and technical support can be provided to improve the reliability of accounting information. Hold.

4. The Implementation Path of Improving the quality of Financial Accounting Information Empowered by Big Data Technology

4.1. Promote the Integration of Industry and Financial Data to Realise the Whole Process Control

Financial accounting information is gradually formed with procurement, production, sales and capital activities. The integration of business and financial data needs to open up the information chain between business data and financial accounting. Take Haier Zhijia as an example, the company continues to promote digital transformation. In 2024, the global operating income will reach 285.981 billion yuan, and improve operational efficiency through digital inventory, digital marketing and other projects, and optimise the domestic order response cycle by 13%. According to the regional business data disclosed by the company, the revenue share of North America, Europe, South Asia, Southeast Asia and the Middle East and Africa is shown in Figure 1. The business data of different regions can form a clear business income structure and provide a business basis for the financial department to carry out revenue recognition, cost analysis and fund management. Enterprises can link purchase orders, contracts, storage and payment data, and integrate sales orders, delivery, collection and income recognition information, so that business data can enter the financial accounting link along the transaction process, reduce the faults of business financial information, and enhance the integrity and traceability of accounting information.

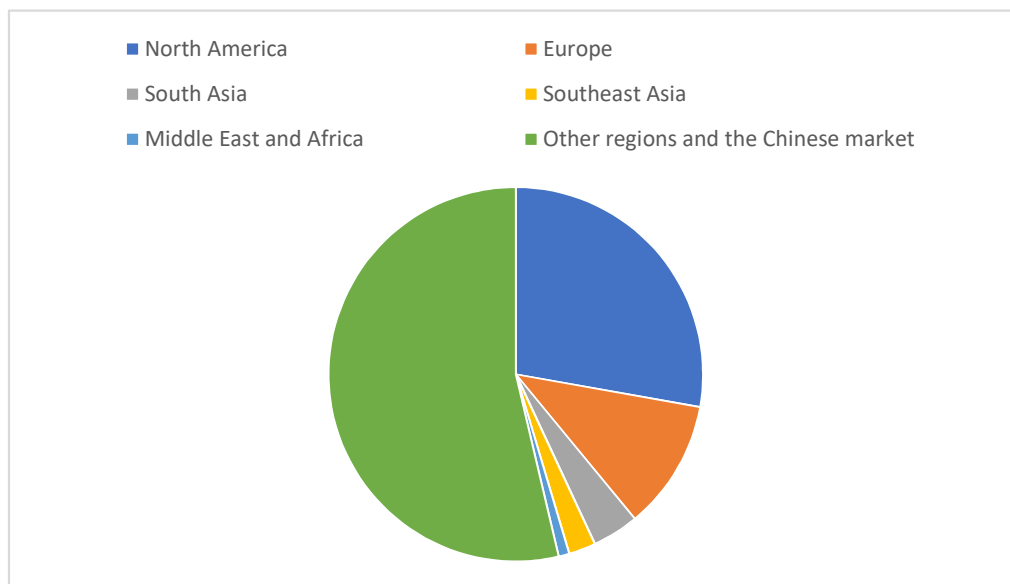


Figure 1. Regional income structure of Haier Zhijia in 2024

4.2. Build an Intelligent Analysis System to Improve the Efficiency of Information Application

Enterprises need to design financial data analysis systems according to the actual needs of different management levels to avoid the application of big data technology at the level of data accumulation and visualisation display. The basic layer can carry out data statistics around financial statements, income costs and capital income and expenditure to provide clear data results for daily financial management; the analysis layer can combine financial data with

business data to observe the operating differences of different products, customers and regions; the forecasting layer can use historical data to analyse the future. Possible business changes provide references for financial planning and budget management. Data analysis at different levels should set corresponding indicator calibres and permissions to avoid excessive entry of irrelevant data into the analysis process^[5-7]. For the prediction results generated by the algorithm, it is necessary to retain the manual review mechanism, and clarify the data source and calculation logic. By building an intelligent analysis system in layers, financial accounting information can be further transformed from traditional report data into business analysis information to improve the efficiency of the use of data resources.

4.3. Improve the Data Security Mechanism to Ensure the Reliable Use of Information

Financial data involves sensitive information such as operating income, cost, capital transactions and customer transactions of the enterprise. After the scale of the data is expanded, permission management, system vulnerabilities and abnormal access may affect the reliability of accounting information. Equifax's data was leaked in 2017, affecting the information of about 145.5 million American consumers, involving sensitive data such as social security numbers, dates of birth and addresses. This case shows that data security management needs to cover data storage, access and use. According to the data collation of public disclosure, it can be seen that there are differences in the degree of impact of different types of information. As shown in Figure 2, the proportion of social security numbers affected is 99.2%, the address information is 67.5%, and the telephone information is 13.8%, reflecting that data with different degrees of sensitivity need to be protected differently. Measures. Enterprises can establish a financial data classification management system according to this, set access rights according to job responsibilities, and implement classification authorisation for income, cost, funds and customer transaction information. Encryption and backup measures are adopted for data transmission and storage, complete logs are kept for new, modified, deleted, exported and other operations, and centralised download, abnormal time access and other behaviours are identified through abnormal access monitoring. Through the cooperation of permission control, data protection and audit tracking, the risk of illegal acquisition, tampering or loss of financial data can be reduced, and the reliable use of accounting information can be guaranteed.

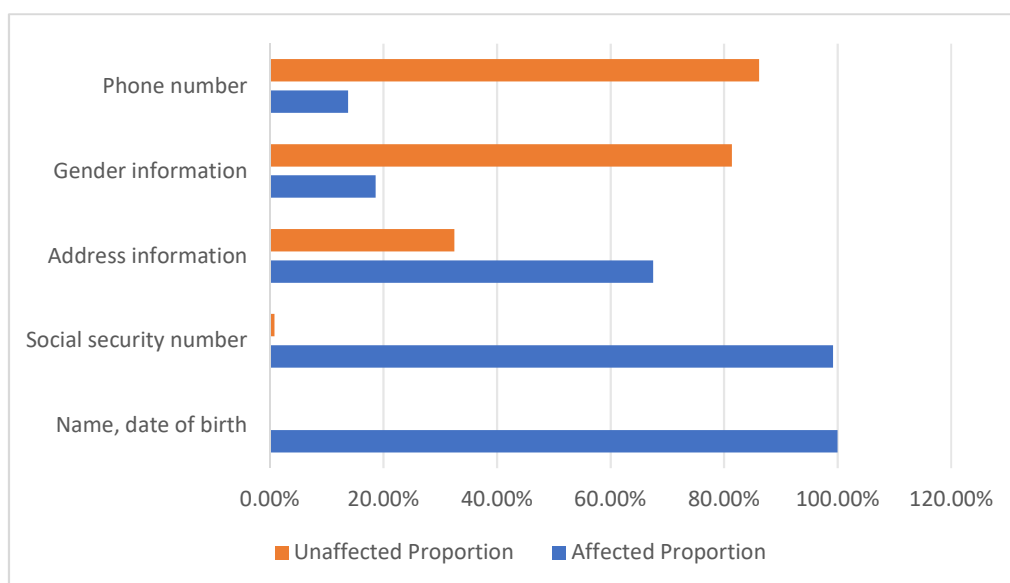


Figure 2. Comparison of the affected proportion of different information types of Equifax data leakage events

4.4. Strengthen the Application of Adaptive Technology for the Cultivation of Composite Financial Accounting Talents

In the big data environment, the work content of financial personnel is gradually expanding from traditional accounting to data analysis, risk identification and management support. Enterprises can establish a hierarchical training system according to job needs, so that financial personnel can master data analysis tools, basic database knowledge and financial information system operation methods, and strengthen their practical ability in data governance, information security and intelligent analysis. For those who undertake data management tasks, training such as data cleaning, data modelling and visualisation analysis can be added; for traditional accounting positions, they can focus on cultivating their ability to use intelligent tools for data verification and abnormal judgement. Talent training should also avoid simply emphasising technical operations^[8-9]. It is necessary to combine accounting standards, financial systems and data analysis, so that technical results can be reasonably interpreted by professionals. Enterprises can improve the data application level of financial personnel through internal training, job exchange and project practice, so that they can gradually adapt to the new working mode, and provide a personnel foundation for big data technology to continue to serve the quality improvement of accounting information^[10].

5. Conclusion

The development of big data technology has provided new technical support for the improvement of the quality of financial accounting information. Its role is not limited to improving the speed of data processing, but gradually runs through data collection, business accounting, information analysis, risk identification and supervision and management. In response to problems such as dependence on manual processing, lagging information feedback and insufficient risk identification, enterprises should promote the integration of industry and financial data, establish a whole-process data control mechanism, use intelligent analysis to improve the efficiency of financial information application, and enhance the guarantee of technology application through data security management and composite talent training. With the further penetration of financial data and business data, the accuracy, timeliness and reliability of accounting information are expected to be continuously improved, providing a more stable data basis for enterprise business decision-making and financial management transformation.

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