Application of Distributed Database System in Financial Management

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Abstract. With the rapid development of information technology, information technology has gradually been incorporated into financial management, and more and more enterprises are using financial management in their operations. The financial management level in today's enterprises is relatively low and cannot meet the needs of the enterprise, so it is necessary to further upgrade financial management. This article studied the application of distributed database systems in financial management, aiming to further improve the level of financial management through distributed management systems. This article tested the efficiency improvement of financial management after using a distributed database system through experiments. The experimental data showed that the efficiency has improved by at least 13% and the highest by 19%. Through this experimental data, it can be proven that distributed database systems can indeed have good results in financial management.

Keywords: Financial Management · Distributed · Database Systems · Information Technology

1 Introduction

Many scholars have conducted research on financial management. Atmadja A T studied the quantitative asset pricing implications of financial intermediaries facing leverage constraints. He used recursive methods to construct global solutions to explain occasionally bound constraints [1]. Cumming D J found that during financial crises, the predictive power of all traditional financial distress prediction models has decreased [2]. Asaff R believed that financing decisions are one of the important areas in financial management to increase shareholder wealth, and companies can use debt or equity capital to finance their assets [3]. Although there is a lot of research on financial management, there are still many shortcomings in financial management.

2 Use of Distributed Database Systems in Financial Management

2.1 Current Financial Management Issues

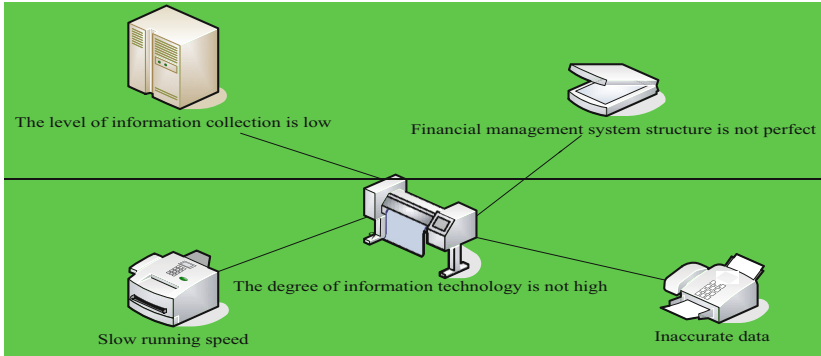The problems in financial management are shown in Fig. 1.

Fig. 1. Problems in financial management

The level of financial information collection for enterprises is relatively low. Whether the work of enterprise management accounting can be successfully carried out largely depends on the level of financial information collection of the enterprise [4, 5]. However, the current level of financial informatization in most enterprises is only at the level of purchasing a set of financial software to conduct accounting and supervision, and cannot achieve the goal of establishing a data center for enterprises. Management accounting can choose appropriate methods and models, and obtain corresponding data results. In the process of comparing these data, various risks that exist in the development process of the enterprise can be identified in a timely manner. While doing internal control well, targeted improvement measures can also be proposed to help managers make decisions. Therefore, the low level of financial informatization in enterprises has become one of the factors restricting the development of management accounting [6, 7].

Only in this way can the efficiency and quality of financial management work be improved, thus promoting the healthy and stable development of the company. However, so far, the financial management of many state-owned enterprises still remains in the traditional management mode, and the level of informatization is not high, which has a significant impact on the efficiency and quality of enterprise financial management [8, 9].

The system and structure of enterprise information financial management are not perfect. At present, most enterprises have not yet formed a unified processing system for financial big data [10]. Even some enterprises have not yet established a unified software platform for managing financial big data, making it difficult to integrate these data.

2.2   Construction of Financial Management Big Data Platform

In recent years, with the rise of the "Internet", many enterprises have begun to turn to this model. The biggest change brought about by enterprise transformation is that the business activities of enterprises have gradually shifted partially or completely from offline to online. The change in business activities has led to significant changes in the way companies obtain financial information. The process of building a big data platform is shown in Fig. 2.
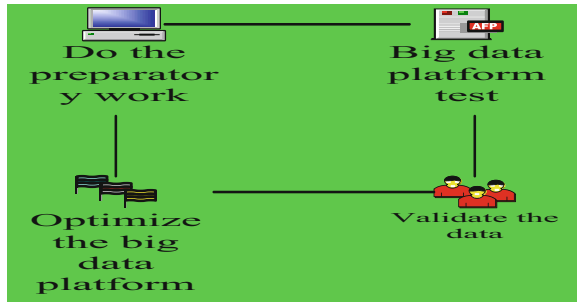
Fig. 2. The process of building a big data platform

Firstly, enterprises need to make the most basic preparations. Enterprises should collect necessary information and materials during the process of building a big data platform based on their industry and business requirements, in order to ensure the efficiency of building a big data platform. Secondly, testing of big data platforms is required. Referring to relevant materials, a system platform that integrates cash flow management, profit distribution management, and fund financing management can be established. On this basis, combined with the actual situation after industry integration, the role of the financial management big data platform was verified. Thirdly, it is necessary to optimize the functionality of the financial big data platform.

2.3 Overview of Distributed Database

Distributed database technology is a product that combines database technology with distributed technology. One database technology was specifically mentioned. Different databases are geographically dispersed, but logically, they belong to the same system. The system does not attach importance to centralized control of the system, but rather emphasizes the autonomy of each database node. In addition, in order to reduce the workload of programmers when writing programs and the possibility of system errors, no consideration is usually given to the distribution of data, so that the distribution of system data is always transparent.

2.4 Application of Distributed Database in Financial Management

Distributed databases have a wide range of applications in daily life. For example, the familiar shopping website Taobao has countless people logging into it every day. The reason why people can see their shopping records and shopping related information is because they have a powerful database. The method of using databases for financial management is as follows: Firstly, the application of distributed databases in financial management greatly reduces people's work intensity, eliminating the need to spend a lot of time and effort on detailed registration of each member's personal information and economic status. The financial management system is completed by computer programmers from inputting data to printing the final results, without manual intervention, thus freeing financial managers from tedious accounting and statistical work.

Under the requirements of modern enterprise management, databases are an effective means to achieve modernization of enterprise financial management. Nowadays, financial information is becoming increasingly rich and important. As a company, they need to understand and analyze these data in the first place, and then make scientific predictions and decisions. In this sense, database technology can effectively solve the contradiction between the increasing amount of information and the lagging management of human resources and funds. The more truthful the financial information of a company, the greater its profits. The use of database technology for refined management of enterprise operations can effectively ensure the financial security of enterprises and promote their sustainable development.

Secondly, it has put an end to the history of handmade tables and greatly improved work efficiency. In work with the same amount of data, the processing time of computers is definitely much shorter than that of manual labor, and the accuracy and efficiency of database processing data are also unmatched by manual labor. This application gives people the ability to process information in real-time that manual operations do not possess. Using a database for financial management has transformed manual management from multiple individuals to machine management for one person, saving both manpower and material resources.

On the other hand, the application of database technology has also improved the quality of reports. Originally, manually summarizing financial statements was not conducive to accountants conducting amateur assessments. After using a database to summarize financial statements, some non-standard units filled in the reports can be directly displayed in the database, thereby improving the qualification rate of the reports.

2.5 Financial Management Database System

Analyzing the operational performance of basic data: For ordinary enterprises, information system operators are not information technology workers and cannot handle the complexity of information systems. For financial management information systems, the main task they need to do is to input some system data into the financial management information system, and the rest of the analysis work is basically completed automatically by the financial management information system. In financial management work, a lot of financial data and information are involved. Therefore, in order to manage these data information, it is necessary to fully utilize information technology and network technology, in order to improve the efficiency of financial management.

2.6 Innovative Financial Management Work

In the context of big data, innovation drives development. At the same time, the financial management of enterprises should also take reform as the driving force for development, and strengthen it at every link. In the process of data collection, the authenticity and reliability of data quantification should be taken as the basis to ensure that all financial accounting information in the system has authenticity, comprehensiveness, and objectivity. In data storage work, it is necessary to organically combine information technology and big data technology, and continuously innovate data storage technology to enhance

data security while ensuring the integrity of the data chain. Therefore, in specific management work, it is necessary to continue to improve the construction of databases, so that they can better utilize the value of accounting information resources, classify data reasonably, and accelerate data query and integration.

2.7 Use of Distributed Database Algorithms

There is a naive Bayesian algorithm in distributed database algorithms. The naive Bayesian algorithm provides a series of training samples and instances related to the objective function when applied, and then predicts the target values of new instances for classification. The goal of the naive Bayesian algorithm for new instance classification is to describe the attribute value $<c_1, c_2, c_3, ...c_n>$ of the instance. P represents probability, and the obtained target value is shown in Formula (1):

$$A = \arg \max P(c_1, c_2, c_3, ..., c_n) \tag{1}$$

The naive Bayesian algorithm classification is based on a basic assumption that the target value attribute values are independent of each other. Based on this assumption, Formula (1) can be transformed into Formula (2):

$$B = \arg \max P(c_1) \prod P(c_n) \tag{2}$$

It is assumed that R is a random discrete variable, the local probability of each variable in the Bayesian algorithm is represented by P(R | D), and the calculation method for P (R | D) is shown in Formula (3):

$$P(R|D) = zP(R) \prod P(D_i|U_i) \tag{3}$$

In Formula (3), z is a generalization factor; U_i represents the set of parent nodes of variable D_i; ; P (R) represents a prior probability; P($D_i|U_i$) represents the local probability distribution of D_i.

3 Simulation Experiment on the Application of Distributed Database System in Financial Management

Distributed database systems can bring convenience to financial management. This article tested the efficiency improvement of financial management after using a distributed database system through experiments. If the efficiency improvement is good, it indicates that distributed data systems can indeed achieve good results in financial management. This article selected five groups of enterprises that used a distributed database system for financial management, and the improvement in financial management efficiency is shown in Fig. 3.

From the experimental results in Fig. 3, it can be seen that the efficiency of enterprise financial management using a distributed database system was improved by at least 13% and at most by 19%. From this experimental data, it can be seen that distributed database
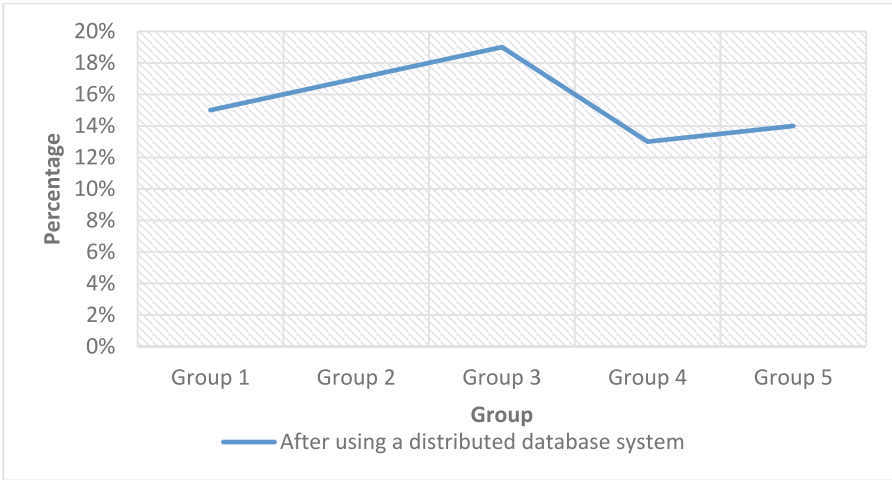
Fig. 3. Financial management efficiency improvement of enterprises using distributed database system

systems can achieve good results in financial management, as they can improve the efficiency of enterprise financial management.

This article once again tested the amount of unnecessary loss of financial assets within a month using a distributed database system for financial management, and then compared it with financial management without using a distributed database system. The comparison results are shown in Fig. 4.
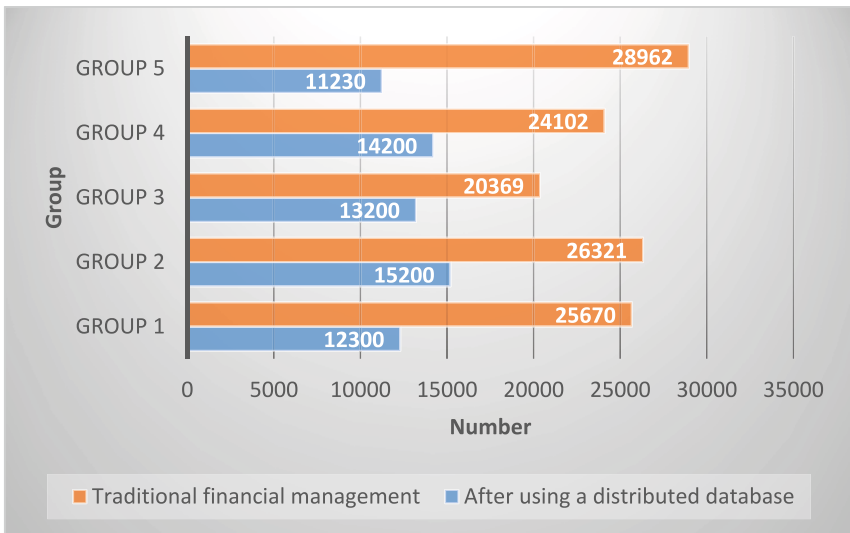

Fig. 4. Two kinds of financial management property loss situation comparison

According to the experimental results in Fig. 4, it can be seen that the maximum amount of unnecessary loss of property within one month after using distributed database financial management was 15200 yuan, and the minimum was 11230 yuan; the maximum amount of unnecessary loss of property in traditional financial management within a month was 28962 yuan, and the minimum was 20369 yuan. From this experimental data, it can be seen that distributed databases have the effect of reducing unnecessary property consumption in companies, which is of great significance for enterprises. Through the above two experiments, it can be seen that distributed databases and financial management have a good fit.

4   Conclusions

Financial management is very important for enterprises. Having good financial management in an enterprise can greatly improve the efficiency of handling affairs and save a lot of manpower and resources. So, nowadays many enterprises choose to use financial management, but in fact, using financial management requires the use of distributed databases to achieve better results. Distributed databases can store a lot of personnel information data, and can be saved for a long time, so that personnel information data is not prone to errors and omissions. This article focused on the application of distributed database systems in financial management. This article tested the efficiency improvement of financial management after using a distributed database system through experiments, and found that the data is considerable, indicating that the distributed database system can achieve good results in financial management. Due to space limitations, the experiment conducted in this article is not bad and would be improved in the future. Finally, it is hoped that financial management would become more and more in place.

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