Research on Enterprise Financial Information Management System Based on Large Data Technology and Block Chain Fusion

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Abstract. In recent years, the rapid development of big data and cloud computing has had a profound impact on the integration of accounting and management accounting. In the Internet era, enterprises' financial information is more transparent and open. For modern enterprises' needs of financial management system informationization, the enterprise financial management information system based on big data scenarios is designed and implemented. The system is designed based on the philosophy of software engineering, and the functions to be implemented are selected rationally by investigating the requirements of the financial management work system of the enterprise. The system is implemented based on B/S architecture, and the design of database follows the relevant specifications in software engineering. The system can enable fine management of enterprise financial data, reduce enterprise operation cost, and thus improve the comprehensive efficiency of enterprise business.

Keywords: big data technology; block chain; financial management; information systems

1. Research background

The application of big data and blockchain technology has become a new trend in the development of information management accounting in the Internet era. In the field of accounting, traditional finance personnel need to devote great efforts to accounting and supervision when dealing with a large amount of historical costs, transaction records and other basic information. With the continuous progress of big data technology and its penetration into the daily work of enterprises, the relevant business processes of the finance department have undergone more and more changes. The traditional manual accounting model can no longer adapt to today's complex and changing economic environment and the increasing demand for information. The advent of the big data era has brought about great changes in the field of accounting and management, replacing traditional manual bookkeeping records with new technologies such as financial cloud computing technology (RFID) and Internet+, which have played a positive role in the computerized construction of enterprises.

Currently, there has been some progress in the research on the enterprise financial management system. However, there are still certain problems in the whole informatization process, specifically: (1) The system lacks standardized definitions, and the data interfaces and data structures of enterprise financial systems lack uniform definitions, resulting in poor interoperability between different information systems; (2) the amount of relevant data is increasing day by day, and the original system has defects in database design, resulting in too much data that cannot be effectively saved and utilized; (3) the degree of commercialization is low. Most of the financial management systems used by enterprises today have developed based on financial management software and have not been specialized and customized for the financial management of enterprises [6]. According to the above analysis, this paper combines big data technology, conducts an in-depth demand analysis for enterprise management work, and designs a new enterprise financial information system.

2. The relationship between big data analysis and enterprise blockchain

The core of enterprise blockchain is information sharing, and all data will produce corresponding records in the process of production and transaction. Big data analysis is the process of analyzing

massive information and mining valuable information to support enterprise decision making in the process of enterprise informatization. The original accounting system needs to be improved and optimized in the process of integration of big data and financial accounting, which will also promote the synergistic operation of management and decision support systems and other aspects to a certain extent. Therefore, we can see that there is an interdependence and interaction between the two. On the one hand, it can transform the traditional financial information processing method to an intelligent and networked financial information system based on the cloud computing platform in order by implementing big data technology. On the other hand, it can provide personalized services and value-added services by integrating the functions of existing accounting software to meet different users' needs.

3. Framework of financial management information system under big data and blockchain

From the viewpoint of the goal of integrating financial accounting and management accounting, enterprises must fully consider the demand for various information in the era of big data when making decisions. And as new features such as information technology, cloud computing technology and Internet application areas continue to improve and develop up, a data mining framework diagram is presented in Figure 1. We can divide it into three layers: 1) By establishing a model centered on cash flow to measure the company's operation and management capability level, enterprises can assess whether their business processes are in line with the set goals, and also analyze and integrate data appropriately according to different departments and positions. 2) In the era of big data, enterprises should strengthen the exchange of information within the enterprise. Enterprises should collect and process massive amounts of unstructured or semi-structured stored data through Internet platforms and provide timely feedback to their management. For example, enterprises can use network technology to establish real-time database systems for remote control and other functions. 3) Enterprises should strengthen the ability to influence financial reporting on changes in the external market environment and the level of sensitivity analysis required to improve the efficiency of financial and accounting management.

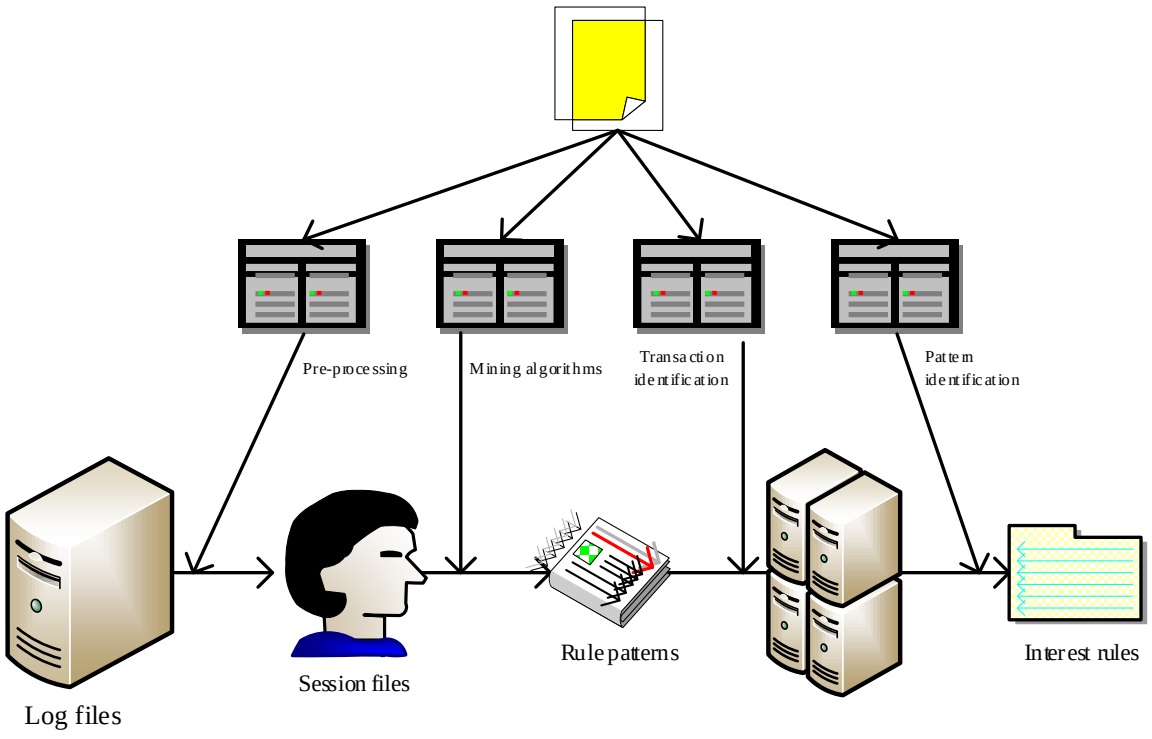

Fig 1. Data mining framework

4. Implementation of the financial management information system

4.1 Design of overall system structure

In the functional design of the system, the functional modules of the system are clearly divided through detailed requirements analysis, and the complete functional modules can meet the needs of enterprise financial system informationization. In this section, the implementability of the system functions will be investigated based on the functionality of the system. And each function of the system will be implemented by using the mature technical architecture. For this system, the system architecture shown in Figure 2 is used. As can be seen from Figure 2, the system deploys two databases and servers each. The left side of Figure 2 shows the process of publishing on the financial system within the enterprise, and the right side shows the process of accessing the system through the Internet on the extranet. The architecture that separates publishing and accessing can ensure the correctness of content publishing and the convenience of accessing, which meets the requirements of the enterprise financial system for the accuracy of data and the security of database reading and writing.

In addition, in view of the increase in the number of enterprise visits and the expansion of the enterprise scale that will lead to a dramatic increase in the volume of data, the future enterprise financial management system must be oriented to big data processing scenarios. Therefore, there needs to be a clear definition for the design of the system data interface and database. Thus, it can better support the operation of the whole system from the underlying layer and complete the data communication with other enterprise information systems.

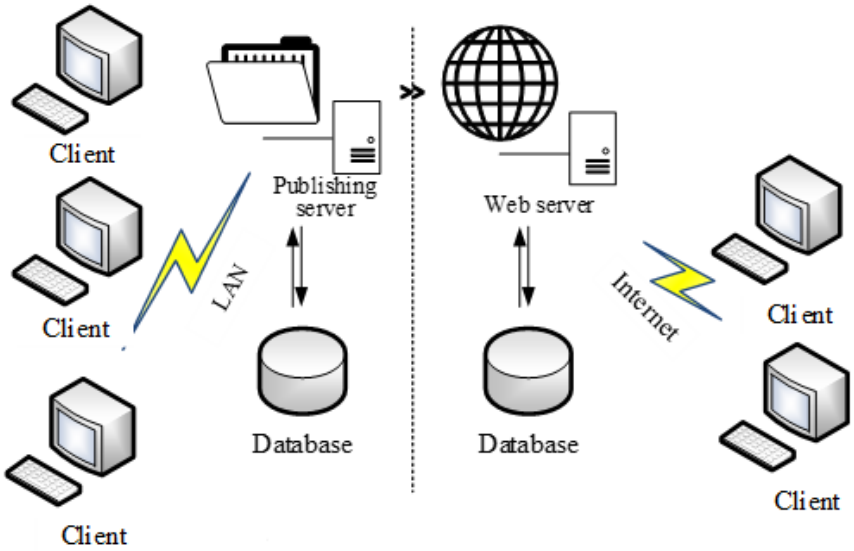

Fig 2. Overall system architecture

For the financial management information system oriented to the big data scenario, the database design is an important part of the whole system. For this system, the database completes the storage of all data in the system, and various operations of the system are essentially the query and read/write of database information. Therefore, it is of great importance to use a suitable set of database schema to enhance the operation speed and operational reliability of this system.

The design of the database is actually the design of the entity fields involved in the system. In the design process, companies should first consider the type of each entity. Then, enterprises should create database tables to characterize various information of the entities and record the changes of their states in the data. In addition, during the design of the database, enterprises should also strictly adhere to the principle of consistency. Database consistency is reflected in the definition of illegal operations, read permissions and input data in line with the paradigm theory. The paradigm theory contains the first, second and third paradigm laws, which are the normative principles of database

table design. With the information table of enterprise staff as an example, some forms of this system are designed as shown in Table 1.

As can be seen from Table 1, the data table contains fields such as EID, Name, Tel, DID, Area, Dname, etc., containing unique primary keys for association between different tables. In the programming process, the employee's EID can be used to associate the employee's personal information table to view his or her more detailed personal information, such as ID number and title level. Different tables have different application scenarios. In the design process, enterprises should avoid tables with too many field names or too long tables, and the existence of such tables may affect the flexibility of the database and the responsiveness of the system.

Table 1. Design of Employee Information Table

Field name	Data type	Length	Description	Primary key
EID	Varchar	10	Employee number	Yes
Name	Varchar	20	Name	No
Tel	Varchar	20	Contact information	No
DID	Varchar	10	Department number	No
Area	Varchar	50	Region	No
Dname	Varchar	30	Department	No

4.2 System implementation

In terms of specific implementation, the system is based on B/S architecture, and the database is designed using SQL Server 2006. JDBC is used to link databases. With the full name of Java Database Connectivity, JDBC is an API function often used in Java to interact with SQL statements and database information. JDBC can be used to simplify database operations and make the implementation of functions more standardized and regulated.

The specific connection method includes five steps, and the exact process is shown in Figure 3.

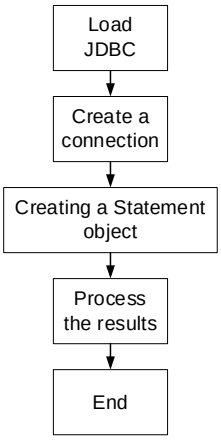

Fig 3. JDBC connection flow

Step 1: Load JDBC: Use the method of Class.forName, and according to the database version used in this system, input the parameters as. SQLServer-Driver;

Step 2: Create the connection: define the URL and related information for all connections, specifically including URL address, user name, password, and then use the Driver-Manager.getConnection method to input these three parameters;

Step 3: Create the Statement object: use the CreateStatement method to create the object;

Step 4: Process the result: use the Next method included in each return to move within the table, associate the index and the table in the database, and return a different type of result;

Step 5: End: Close the connection using the Con.close method. It should be noted that a large amount of arithmetic overhead is generated during the closing process, so it is necessary to ensure the completion of the operation before closing.

4.3 System testing and evaluation

System testing is the final step in the development and implementation of an information system. Through testing, we can confirm whether the relevant functions are satisfied and whether they can meet the actual usage requirements. The system is tested using a black-box testing method, which means that the required data format is entered into the system to check whether the desired results can be achieved.

the system provides common features for report management such as report query, data replenishment, and custom statements. For the query of reports, it can also conduct classified query, such as querying financial statements, credit statements, and final accounts statements. It can be seen that the report management is completely functional and can run smoothly, meeting the requirements related to report management in enterprise financial management.

5. Conclusion

This paper first analyzed the research background and significance of the integration of financial accounting and management accounting under big data and blockchain as well as a review of relevant literature at home and abroad, and explored it in depth after combining the actual situation of enterprises. In this paper, the financial management information system of the enterprise was implemented. In the process of system implementation, a complete system requirement analysis was conducted based on the idea of software engineering to ensure the integrity of system functions. In the system implementation architecture, two databases and servers were used separately for deploying the system in order to meet the requirements of data accuracy and database read/write security. At the same time, this paper also took into full consideration the increasing data demand of enterprises when implementing the system, and focused on the design specifications of data interfaces and data tables in the design of the database to ensure the effectiveness of the system in big data scenarios. The system has been tested and can meet the use requirements of enterprise financial management work.

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