Construction and Application of Enterprise Financial Management Sharing Service Center under the Background of Big Data

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Abstract. Based on the analysis of the characteristics of enterprise financial sharing service center, this paper studies the existing problems, puts forward the effective strategy of building enterprise financial management sharing service center under the background of big data, and gives the specific design and application scheme. This system adopts SSH lightweight framework under J2EE structure and uses java language to build applications. Hadoop's big data server cluster is used for data processing, and HDFS, Mapready, sqoop and other components are used in combination, so as to provide some reference for financial sharing of large enterprises.

Keywords: big data; Hadoop; C4.5 decision tree; shared service center; financial management

1   Introduction

The expansion of large-scale enterprises needs to make their subsidiaries spread all over the country and even all over the world, which also makes it difficult for the head office to manage the subsidiaries efficiently due to geographical problems. It is urgent to reform the financial management within the group. Nowadays, with the rapid development of big data technology, many enterprises have begun to improve their financial management by means of information network. The financial management sharing service center is a widely used model. The financial sharing service center can supervise the funds and internal control of the branch company, and it is also convenient for the branch company to call the relevant funds to the headquarters. It can not only dynamically release the internal and external information of the enterprise, but also provide guarantee for the unified construction of information platform. [1]

According to the above analysis, the author thinks that the application system of enterprise financial management sharing service center should be developed in combination with big data technology. And develop four functional modules: ERP system, image management system, budget and network reimbursement system and bank-enterprise interconnection system. Through the financial management sharing

center, enterprises can integrate a large number of financial information and data, and achieve effective monitoring. Strengthen the normative practice of the relevant personnel of the branch and improve the transparency of the financial management data of the enterprise. In addition, the financial sharing center can make the financial reports of enterprises more scientific and effective, and ensure that the financial analysis results and decisions are more accurate, which is a powerful promotion for the overall operation of the company.

2   Technical summary

2.1   Hadoop

Hadoop is an open source big data ecological framework system developed by Apache funders. The core components of Hadoop include distributed storage file system HDFS, concurrent computing system mapreduce and resource scheduling management system yarn. Hadoop's operating principle revolves around these core components. HDFS can provide an interface to access files of Linux operating system. Therefore, HDFS can perform the operations of adding, deleting and modifying various files in Hadoop cluster. HDFS consists of many nodes built on different servers, and the nodes are divided into master node namenode and slave node namenode. At the beginning of Hadoop cluster establishment, all data will be entered in various ways and stored in HDFS. [2]

2.2   J2EE technology

One of the most widely used technologies in building web application system is J2EE technology. J2EE is a set of operating specifications and a technical guide for development and application. It can simplify the processing of all kinds of complex problems and systems in the construction process of application system development scheme based on java2 language. The application system simplified by J2EE can be divided into three layers: application service layer, enterprise information system layer and customer layer. The important advantage of J2EE framework is components. Include Web component and EJB component. EJB can store, communicate, process and manage the whole application system, and manage its whole life cycle. Web components, including JavaBean, Servlet and JSP, can perfectly handle all kinds of requests and responses of users and output the operation process. [3]

2.3   Development environment

The audit information system of small and medium-sized Internet financial institutions uses Hadoop's big data server cluster for data processing, and uses JavaWeb technology to develop the corresponding application platform to present the functions and effects of the system. The operating system of the cluster is Linux centos7, and Apache tomcat is used to build the server. The server cluster builds Hadoop big data

processing server cluster according to the data volume of enterprise financial management sharing service center. We can choose a master server as the namenode of Hadoop cluster, and the remaining servers are slave datanode, and assign the IP address of each server node, and the nodes are connected by ping.

In this paper, SSH lightweight framework under J2EE structure and java language are used to carry out the project construction of enterprise financial management shared service center. The specific framework is Struts2+spring+hibernate, which can be integrated into web.xml through configuration files. MySQL7.9 database is adopted for data storage and management. Deploy applications in tomcat7 cluster mode. The front-end development tool of this paper is vue.js, and the development language is HTML+CSS+JavaScript. Through the introduction of the above key technical theories, the overall environment, the configuration of related software and tools for the development of enterprise financial management shared service center system are determined, and the technical feasibility of the overall project is also defined.

3   Development process

The users of the financial management sharing service center are the financial managers of large enterprise head offices in the form of groups, followed by the administrators responsible for system maintenance. The main functional modules of the common user port are composed of four subsystems: ERP system, image management system, budget and network reimbursement system and bank-enterprise interconnection system. The ERP subsystem of this platform is the core function module, which can integrate, control and optimize the financial business process of the whole group composed of head office and branch offices. The functional modules under the secondary directory of ERP system are centralized inquiry, voucher accounting, basic data management, logistics coordination, etc. [4]

4   Functional implementation

By adopting the financial sharing mode to create a perfect service center system, the centralized setting system platform of financial accounting can be disposed of, and a financial working mode of enterprise strategic analysis, business analysis, business analysis and shared services can be created. In this part, this paper introduces the realization of the key function module-voucher accounting. The main implementation class of this function module is VoucherManageAction.java. The accounting process is as follows: open voucher-import voucher-export voucher-approve voucher-cashier voucher-bookkeeping voucher. These operations of the system are named openVoucher (), importVoucher (), exportVoucher (), check (), cash (), post () respectively. Key codes for generating general ledger vouchers are shown in Figure 1. [5]

The system realizes the entity object persistence of voucher data by using EntityManager in ORM framework. The implementation classes of the integration layer include voucher master information entity class BaseVouMainEntity.java, voucher detail information entity class BaseVouDetailEntity.java and voucher master infor-
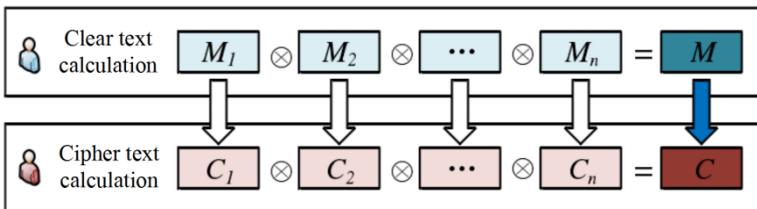
mation class DAO VoucherMainDAO.java. The business layer of this functional module uses the declarative transaction in spring framework tools to manage the voucher transaction and maintain the abnormal state. At the same time, declarative transactions can also call workflow engine interface and task pool interface.

```java
package com.freesky.em.gl.core.voucher.action;
public class VoucherManageAction extends BaseAction
{
private IVoucherManageService service;//Inject the service
private String voucherInfo;//Voucher information
private File file;//Import voucher files
private String fileContentType;//Import the voucher file type
private String fileFileName; //Import the voucher file name
/**
* Generate a formal general ledger certificate
*/
public String updateFormalVoucher()
{
if (isNullOrEmpty(this.getJsonString()))
{
this.service.updateFormalVoucher(this.getJsonFilter());
}
else
{
this.service.updateFormalVoucher(this.getJsonString(),
this.getJsonFilter());
}
this.setJsonString("");
return SUCCESS;
}
```

Fig. 1. Key codes for generating general ledger vouchers

As the financial management sharing service center involves commercial secrets, it needs to have strong confidentiality. This paper studies the homomorphic encryption function method to calculate the encrypted data. By using the mapping relationship between two related sets in mathematics, the related operations of set elements are reflected. First, you need to give the $g:X{\rightarrow}Y$ that can represent the mapping relationship. When the condition is $g(\varphi_X(x_1, x_2, ..., x_n))= \varphi_Y(g(x_1), g(x_2), ..., g(x_n))$, where $x_n \in X, g(x_n) \in Y$, when the conditions are met, it can be judged that x and y are homomorphic. The operation process of homomorphic encryption algorithm is shown in Figure 2.

Fig. 2. Operation process of homomorphic encryption algorithm

5 Conclusion

The related research on financial management shared service center is short. This paper uses the modern information technology of big data to improve the development level of shared service mode, hoping to attract more large group companies to widely apply this service mode. The system has gone through a complete process of testing and commissioning, and the author of this paper believes that there are still many aspects to be further studied and improved. When the system synchronizes the financial management transaction information of the whole group, the average response time is relatively long, and all these related business tables will be scanned, resulting in a long processing time. Considering the rapid growth of business data, the database design can be optimized.

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