



Drools Rules Engine Used in Management Accounting System Design Research

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Abstract. On this basis, according to the actual needs of enterprises, the enterprise management accounting system is optimized. Through the research of Drools rules engine, the development of management accounting system based on Drools rules engine is realized, and the software architecture of the system is designed. The function of each main module is introduced in detail, and the receiving and processing process of single and batch transaction data is designed in detail in the software, which makes it possible to automatically generate and save accounting vouchers, accounting entries and other information. The feasibility and practicability of this system are proved by the test of practical application [1].

Keywords: management accounting · System design · Drools rules engine

1 Introduction

In the daily operation of enterprises, management accounting system plays a very key role. It can timely feedback the profit and loss of enterprises to the managers of enterprises, so as to provide reference for enterprises to develop reasonable business strategies. With the rapid development of e-commerce, the third-party payment is widely used, which is accompanied by the increasing number of daily transaction orders. Traditional management accounting system, when entering the accounting vouchers and entries of each transaction, its automation level is not high, it is difficult to achieve automatic trial balance, nor can provide the corresponding business rules, it is difficult to adapt to the increasing business needs. Management accounting system needs to record every transaction in detail, so a stable and effective management accounting system has become a problem to be solved at present.

2 Management Accounting System Design

2.1 System Data

Processing process is a comprehensive application system, it has a huge scale and a huge amount of data, so in the system design, it needs to have a certain degree of scalability, so as to better meet the growing business needs. From the point of view

of meeting the needs of actual accounting business, this paper defines the overall goal of the system and improves the performance and security of the system. This system uses B/S architecture, users can use Internet browsers (such as IE, CHROME, SAFARI, etc.) to interact with the management accounting system, without the need to install the client. The user first initiates an online transaction (via HTTP/TCP request) to the business system. The transaction system records the data into the database, and then sends an ActiveMQ message to the Apache ActiveMQ server through TCP/IP protocol. After reading messages from the active MQ server, the data receiving and processing subsystem uses the Netty communication framework to complete the interface call of the rules engine subsystem. On this basis, the transaction information is converted into accounting vouchers, and then sent to the rules engine subsystem for processing: According to predetermined accounting rules, accounting vouchers are converted, JDBC is used to realize the connection between the rule engine and Oracle database, and corresponding accounting vouchers and entries are recorded in the same database transaction, so as to ensure the integrity and consistency of data, which is realized by the business system actively pushing data to the management accounting system [2].

In accounting batch task, can use ORACLE DBlink technology to achieve. The database of management accounting system is connected with the backup database of each business system, which can quickly read the historical transaction data of each major business system, and then convert it into the accounting voucher object, and write it into the cache. The system can receive the accounting credential object in the cache through a call to the Drools Rules engine subsystem interface. The rules engine records each accounting voucher in the database, converts the voucher into an accounting entry and records it in the database. There is a one-to-many relationship between accounting documents and accounting entries [3].

Financial personnel use the accounting rules and background management subsystem, maintain the basic data used by accounting rules (such as accounting accounts, bank gateways, etc.), and the rules engine accounting errors of the data for timely adjustment.

2.2 Overall System Software Architecture

In order to facilitate modular and standardized operation and management, the system design adopts a three-layer architecture system, namely, the data access layer, the business logic layer and the presentation layer. The system software architecture is shown in Fig. 1. As shown in Fig. 1:

(1) The display layer is displayed in the form of a web browser. Its main function is to interact with various major business systems and provide services for external end users. For example, users can browse and operate related businesses by using the web browser for online payment. Internal staff can use the background management subsystem, to achieve the accounting account, bank gateway, bank rate Settings and audit, as well as query and export reports and other functions, so as to significantly enhance the convenience of system operation and use. (2) Business logic layer, whose role is to realize the main business logic of the system, which contains four subsystems, respectively: Data reception processing, rule engine, rule management and accounting back office management, as well as providing an external interface to the SMS system and mail system, after some specific business has been completed, for example, the

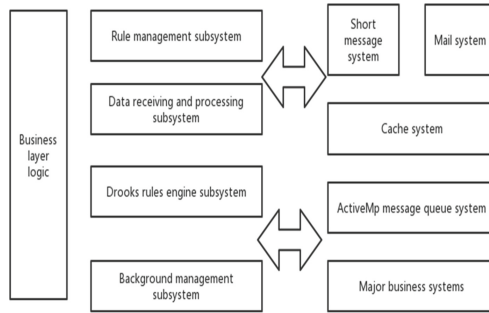


Fig. 1. Management accounting system software architecture diagram

data reception processing subsystem has generated accounting vouchers and accounting entries in the transaction data of a certain accounting date, The system will notify the relevant financial personnel by SMS and email; Or when the system fails, the developer is notified in time, and the transaction data information of each business system is received through the ActiveMq message queuing system. Improve the performance of the system by leveraging the data for Memocached caching system [4]. (3) Data access layer, which is connected to the business logic layer via JDBC and uses the relational database Oracle to manage the basic data of the accounting system (including basic data as described in accounting standards, accounting accounts, bank gateways, etc.), At the same time, it is also responsible for the storage of accounting documents, entries and other data; To ensure the security of transaction confidential data, production environment data shall not be accessed by the test environment.

And a dedicated DBA is required to perform the DML, DDL publishing in the database. Financial personnel and company management have the right to query and export statements (including profit statement, cash flow statement, balance sheet, etc.), and can realize high-speed cross-library access between the business system and the database of the system by using DBlink technology [5].

Because of the use of Drools rule engine, the business logic module can be separated separately, which realizes the loose coupling at the code level. As long as the xml or drl rule file is edited well online, it can realize the addition or modification of accounting rules, which can avoid the workload brought by the recompilation of code and the release of the new system version. The subsystems are unified by the Saturn framework with a clear code architecture that allows easy maintenance and extension, as shown in Fig. 2.

3 System Implementation

3.1 Reception and Processing of Single Transaction Data

(1) Data message reception.

The data receiving processing subsystem implements data receiving by adding the following configuration to the spring profile accountfront-biz.xml:

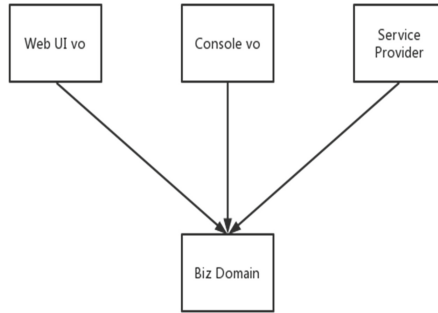


Fig. 2. Saturn frame

```

<bean parent = "" saturn message list container}} > <Property name = destination
name> Value = (TP_).
SC_ACCOUNT_FRONT request /)
<Attribute name = message list>
sageListener >
  
```

After the configuration added above is complete, each server system will TP_ to the queue

SC - Receives request request messages via Mes-

A sageListener object is all it takes to listen and receive (5). (2) Data message processing After the message in the queue is received by the MessageListener, it needs to process the message in a unified JsoN message format. There are several ways to process the message through the JSONObject Object:

```

JSONObject object = new JSONObject (json);
String value = obj.ge tSt ring (key name);
  
```

The transaction information from each business system is analyzed and converted into the corresponding accounting voucher request object, which is then passed on to the rules engine subsystem for correlation processing (Voucher facade interface).

3.2 Batch Trading

In this case, it is necessary to use multithreading method to complete, first set a regular scheduling task, and the selection of accounting date, and then use DBLink technology to conduct a large number of cross-library extraction of the business system, and then directly convert the transaction data into the corresponding accounting vouchers, and then through the call to the rule engine subsystem, These accounting vouchers are transferred to the management accounting system, so as to complete the entry of accounting vouchers. Finally, the accounting is carried out according to the rules of generating accounting entries, and the accounting entries are kept in the system database [6]. On the time sequence diagram of the system's processing of mass transaction data, after setting the task plan, the data receiving processing subsystem will receive a message when it reaches a fixed task node, and then start a batch processing to buffer the transaction

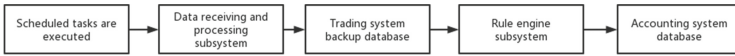


Fig. 3. Batch data receiving processing sequence diagram



Fig. 4. Batch data receiving class diagram

data from the transaction system database into the system memory and convert it into accounting vouchers. Then it is transferred to the rules engine subsystem to perform a mode matching, that is, matching the accounting vouchers with the accounting entry generation rules. After the data field of each voucher matches the condition part of a rule, the system will automatically convert the vouchers into accounting entries and call the data persistence layer. At the same time, accounting vouchers and accounting entries are recorded in the database, so that an automated accounting process is completed. The time curve for processing large amounts of transaction data is shown in Fig. 3.

(2) The system implements the message monitoring object interface of class graph timing task for processing batch transaction data, and implements the message monitoring method of this interface.

Then, the Rule Engine Service Provide interface is used to write the accounting vouchers to the database by calling the accounting vouchers service object. Figure 4 shows a class diagram [7] that uses the object of accounting entry service to write accounting entries to the database and process batch data.

4 System Detection

In order to test the stability and practicability of the management accounting system based on Drools rules engine, the specific test methods are as follows: using the business system to transfer data to the system in this paper, and testing the processing of batch business after accessing the new system. After testing, it can realize the online modification of the changed accounting rules, and also has strong scalability and compatibility. The use of Saturn programming framework, so that the framework structure becomes more clear, do not need to have professional knowledge can operate the system, the system can do real-time and automatic accounting, so as to effectively reduce the company’s financial costs. In the management accounting system, the realization of the unified centralized trading system data, complete the bookkeeping process, so as to avoid repeated bookkeeping

problems, so that the correctness and integrity of the data has been significantly improved, the system has been running for 3 months, and stable operation, the cumulative use of more than 50,000 people, and the business system docking, has achieved good results, In the process of receiving and processing single and batch transaction data, there is no error, which can effectively meet the needs of enterprise business expansion accounting management.

5 Conclusion

In this paper, the actual needs of management accounting as the starting point, focus on the management accounting system optimization design, the application of Drools rules engine in the design of management accounting system carried out a thorough study, and finally completed the design of the overall software structure of the system, and the function of the main modules are described in detail. At the same time, the software design of the receiving and processing process of single and batch transaction data is carried out to realize the automatic generation and storage of accounting vouchers and accounting entries. The test results show that the system can effectively improve the degree of accounting automation, and has high practicability.

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