Design and Implementation of Telecom User Business Management System

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***Abstract*— Now in the process of operation of telecommunication system, telecom user business management as the main part of the system management part, main is to guide the telecom operators how to manage the telecommunication billing system, become an integral part of telecom billing system. In this paper, the design process in combination with the current market competition and telecoms industry mainly aimed at party B's business requirements, and closely combined with the current in the process of actual operation of some of the more advanced technology domestic and overseas, the design is based on JAVA B/S mode of telecom business management system.**

Keywords- User business management system; J2EE; B/S mode;

I. INTRODUCTION

The main research of this topic is the telecom user business management system, which is mainly handled by the decentralized way of charging the telecommunication service. The telecommunication user business management system can be more effective and safe to run, which greatly affects the operation efficiency and credibility of the telecom operating system itself. As the telecom business expanding, the requirement of users is becoming more and more highly, however, such a business management system needs to have features: comprehensive, stability, scalability, portability, flexibility, integration. Obtain reasonable benefit, make the enterprise normal operation and development, and meet the demand of telecommunication user business management system.

II. REQUIREMENTS ANALYSIS

The telecom user service management system mainly designed six management sub modules, including: basic information module, role management module, administrator management module, accounting account management module, business account management module of these six modules. The six sub modules in addition to providing a friendly operation interface and user-friendly function settings for users in the design and development process of the system, but also for the careful design of the database, including authority verification, division of the distribution of authority and role, the precise realization of tariff business flow, account management statistics.

The system should consider the access of each sub module in the design process, and access to the module only with the corresponding access rights.

In the telecom user business management system, some users have the same role and have the same permissions, such as two operators are the front desk operators, all have user management rights and billing management rights. A role represents a set of permissions. The existing roles in the system include: administrators and super administrators. In the future, to manage the role flexibly according to the needs, it is also done by permission management system.

Telecom user business management system function design should include: basic information management module, role management module, administrator module, tariff management module, billing account management module, business account management module.

1) Basic information module: if use business management systems, telecommunication users must have to login. After the administrator login, the display is the basic information module, mainly including the home page, view personal information, modify personal information, the main is responsible for the home page.

2) Role management module: administrators who have "role management" access can view all the role information, and also add roles, browse roles, modify roles, and delete roles.

3) Administrator management module: the access to each module of this system is controlled by permission. Different permissions can only access corresponding modules. After the super administrator login successfully, can add the new general manager, allocate some permissions for him at the same time, can modify the information of the general manager, you can query all the administrator information, you can delete someone from administrators

4) Tariff management module: just as its name implies is to need to charge, tariff management for open source laboratory users will also be same with different levels of charges, as long as it is to use the open laboratory services, also need to charge. One is the time cost for the user to use the service, and the other is the charging standard that the user chooses.

5) Billing account management modules: Billing accounts management module is usually related to the business account management, billing account management is stated in the accounts of telecommunication users to your account and the tariff according to the unified management of the opening of the business and the user account.

6) Business account management module: business account is the tariff opened by the account information of the business, with the tariff is more of a relationship, business account table stored in the corresponding tariff ID is a business account, detailed information and their business standards. The main source of the fee is the tariff management module of the management fee. The business account module and the tariff management module are one-to-one correspondence, which is associated with the name of the fee.

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Although the system adopts sub module design in the design process, its system scalability is high, but at the same time, in order to ensure the reliability of the system, the following requirements should be met to ensure the system does not fail:

(1) The application server uses centralized multi thread, multi service desk and other ways to ensure that the independent fault occurs, it will not affect the completion of the overall system test process.

(2) When the system fails during the operation, it can send out warning information immediately, and the technical maintenance personnel can resume the system in the shortest time.

Here we should consider two aspects of scalability, one is the scalability of the number of users, and the other is the scalability of the system function. The former needs systematic consideration of its data structure, and the reasonable structure design can ensure the speed and stability of data flow. If the platform users increase, the system data capacity can be widened by adding hardware devices and increasing threads. Two is the scalability of system data analysis ability, when the system function is diversified, the system should modify the program as little as possible to meet the needs, or try to improve the configuration to make the system meet the new requirements.

To ensure the manageability of the current system, will be reflected in the overall system development process and systematic construction on the basis of, in order to fully reflect the manageability of the entire system, reflecting the current application of the link effect. Therefore, it is necessary that for application and analysis of different management characteristics of the future effect, will be greatly realized on the current system of the design effect, so as to fully sense of objectivity according to the system design process in order to show up, application on the application characteristics of the current management in order to better meet the needs of the system of current performance analysis, in order to better promote the future development in the process of function and significance is more important. However, how to do more accurately reflect the current institutional analysis, can fully reflect the current management process has a better system and analysis of the application of the embodiment of the role. For the management of hardware and equipment and the management of application system, the system can be improved by setting permissions and other ways to improve the system's modifiable degree and safety factor, so as to improve the manageability of the system. By modifying the management background page and program, simplify the operation module, reduce the difficulty of system upgrade and modification. This requires that when the system is established, it is necessary to have a complete system documentation; two, it is necessary to select a better carrier on the system carrier.

The safety of telecommunications users business management system is mainly reflected in the personal information of users of the system guarantee, such as different administrators in the course of the operation of different administrators and users' personal information there is permission to view and modify, because safety in order to ensure the system better, and the operation of information system for each user and administrator the operation records are bound together. At the same time according to the analysis of the current process of database and application, which has the function of effective and more important. Both the design process of security and the standardization of implementation are more important and reflected. This will have a more important role and significance in the design process of the overall security, so that the current security mechanism can better reflect the confidentiality of users' use of information.

The compatibility of the system is mainly reflected in the compatibility of different system environment, with the rapid development of Internet technology, some of the new operating system will continue to emerge, many companies also to upgrade the system, so the software function of the system should have has perfect compatibility for different system environment. Therefore, it is necessary to carry out more accurate analysis and functional analysis on the management and design of current system software compatibility.

III. SYSTEMATIC DESIGN

In the design process of the telecom user service management system, it is critical to determine the system architecture and the selection of system development technology, and how to choose the network equipment and network technology. This system adopts more mature technical scheme in the design process to realize the telecom business management system which can meet the user's business needs. The basic principle of the system design is to meet the real needs of the telecom business management system. In the design process, we must follow the feasibility of the system, in addition, we should also consider the scalability of the system in the process of upgrading in the future, as summarized below:

(1) The design of the system should take into account the practicality of the current stage and the advanced nature in a short time. In the process of system design, the key technology should be guaranteed to adapt to the adaptability and development of the current technology, and the advanced, mature and universal technology should be selected to ensure the feasibility, reliability and stability of the system.

(2) The system should pay attention to the open and scalable characteristics in the design process. This is mainly because the telecom business management system is a rapid development of the industry, in the next period of time cannot determine any new business needs, whether it can meet the needs of the first phase of business, may add new business at any time. Therefore, taking into account the above factors, the system should take into account the corresponding extension in the design, which can facilitate the two development of the system.

(3) The design of the system to a large extent should be able to meet certain reliability and stability. In the actual use of the system, the system requirements should have a certain ability to resist interference and anti-fault. The system

should have data backup function and operation hint function in logic. In addition, the design of the logical layer of the system should consider some defensive measures to deal with malicious viruses and hacker attacks. The system should take into account the impact cannot be recovered and ensure the security of the data caused by wrong operation in the design of the operation layer, confirm system of new measures and delete records important operation should be necessary, and when the system's hardware and software failures can fast data recovery.

(4) The ability of the external memory data management system for large capacity data processing application database system, including the effective storage path for data storage, and file storage structure effectively and optional, in order to ensure that the system can have good performance of data processing.

(5) Data sharing should be taken into account in system design. Data sharing has two meanings: in order not to cause serious consequences, must require the system compete for shared resources must be strictly controlled, so that more users can simultaneously access the same data; different users can enjoy different confidentiality, multiple users can share the same data.

The system design structure diagram is shown in figure 1.

Based on B/S architecture of the telecommunication business management system involves large amount of data, data table design directly affects the normal operation of the system, thus the accuracy of the data table, rationality is crucial, table structure design must be considered when the two aspects. The database of the system includes financial information table, business information table, tariff information sheet, role list, role permission list, administrator table, and administrator role table.

Figure 2 is the E-R model diagram of the data table:

IV. SYSTEM IMPLEMENTATION

Its design mainly implements the basic information management module, among which the basic information management module mainly includes: login, home page, personal information, change password. The design module also includes: role management module, administrator module, tariff management module, billing account module, business account module.

Basic information module: the basic information module mainly realizes the description of the use case.

1) Diagram, followed by the design of the main page, modifying the password and viewing the personal information [21]. The homepage is the functional navigation page of the telecom user business management system. According to the permissions of the log-in administrator, the function operation displayed on the main page is different.

2) Role management module: when after entering to the telecom user business management system, if you have "role management" permissions administrator login, you can view all the information, also can increase the role, browse role, modify, delete character role.

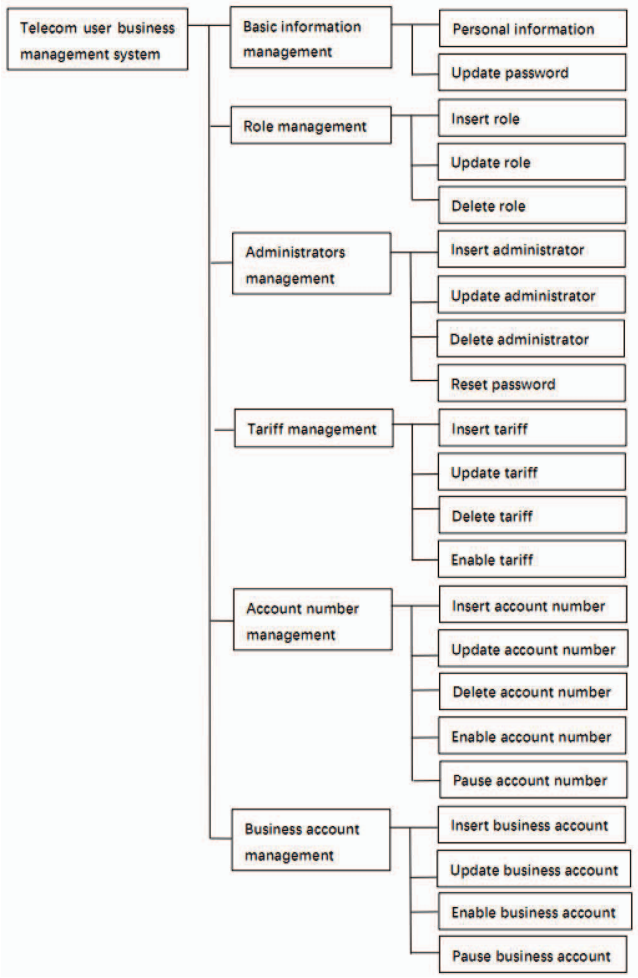

Figure 1. System structure diagram

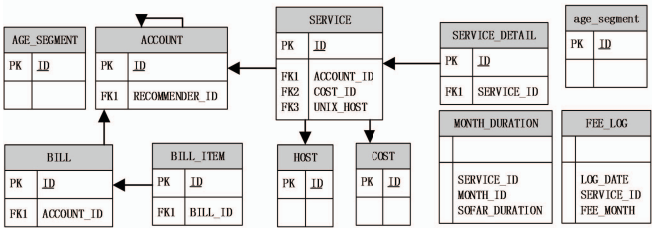

Figure 2. Database relation diagram

3) Administrator management module: the administrator management module mainly implements the super administrator to manage the function of the general manager. The management module interface includes: modification of personal information, querying administrators, modifying administrators, deleting administrators, and increasing the administrator's five service options. Add admin, similar to adding roles, click add button.

4) Tariff management module: mainly include: tariff browsing, tariff addition, tariff modification, tariff removal, and the enabling tariff module of five service modules. After logging into the telecom user's business management system,

you can enter the tariff management module according to the operation prompt, and you can check all the current tariff.

5) Billing account management module: the "billing account management" module in the system, compared with the tariff management module, the conditional query is added, which is realized through the configuration file of Mybatis. The difference between adding an interface and adding an interface to other modules is that the tariff is not a mandatory option, and the optional part is placed in the div, using a floating technique to hide it.

6) Business account management module: the business account management module in the system is similar to the tariff management module.

V. TESTING

The main purpose of the system is to verify that the system can work in a real system environment, and compare with the requirements analysis of the system function, and verify whether the relevant configuration items of the system can be correctly connected with the system. Software testing plays an important role in the whole software development process. Through software testing, software errors can be detected, and according to the error information, using simple and effective ways to find out as many potential errors as possible in the software, so as to ensure the quality of software development. In this way, developers can be aware of the shortcomings of the system, timely improve the system, and ultimately make the system to obtain user satisfaction.

The system is mainly divided into two parts: front test and background test. The front desk test is mainly for the operation of the page, checking the realization of the page, the background test is mainly the logic check of the code.

VI. CONCLUSIONS

This paper first describes the background and development of the telecommunications billing industry, and the domestic and foreign telecommunications industry comparison, and then find their gap, leads to the importance of telecommunications user business management system for the telecommunications billing industry. Under the premise of the diversified demand of telecom industry, operators are changing their business strategy. Software engineers make the design based on B/S mode according to the user's needs. This paper mainly uses the mainstream framework of Java language Spring+Mybatis to complete the design and implementation of Telecom user service management system based on B/S mode. The system mainly includes basic information management module, charge management module, administrator management module, role management module, accounting account management module and business account management module, in which the basic information management module realizes the main part of the home page.

First of all, this paper understands the marketing mode and operation status of telecom industry at home and abroad, and gives a brief introduction to the development status of some large telecom operators. Under the background of the fierce market competition environment and the diversification of customers' demand for products, the paper puts forward the product design pattern and service model proposed in this paper, and increases its competitiveness in the market.

Secondly, according to the business requirements, this paper describes the design and development of the project in detail, and lays the foundation for the progress of the project. In this paper, the functions and characteristics of the modules completed in this project are described in detail. Then, according to the needs of the system to achieve the business requirements, functions and the effect of the comprehensive analysis, to complete the structure of the system organization and framework design, for specific development direction. With the above requirements and design, for each module needs to achieve the effect is clear, you can begin to write code, the entire project operation process.

Finally, in the completed system to achieve the user's business needs and basic functional requirements, after testing and debugging so that the entire system can run normally, and the final realization of the system and the implementation of the code in the paper to do some of the show. The telecom user service management system designed in this paper is based on Java language development, using B/S mode, has good portability and scalability, maintainability. And the project has been put into the teaching of our company, and has certain practical value. However, due to the limitations of various conditions, this study still has some shortcomings, need to continue to improve and perfect.

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