

A System Of Intelligent Meter Management

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Abstract: This system is designed to manage meter data in web page. It's in B/S design mode and user can manage data only with the browser. The system database is oracle, web server is tomcat and the web framework is SSH(struts2+spring+hibernate). The functions include user-access management, entering meter data, distributing orders and problem management.

Keywords: Web, SSH, Oracle meter-management

1. INTRODUCTION

The power industry is the most important energy industry in the development of economy. It is the most fundamental industry of the national economy and is related closely to people's lives. It is the priority of the development strategy of the every country in the world. As an advanced productive force and basic industry, the power industry plays an important role in developing the national economy. It is related closely to social economy and social development and it is not only a issue related to national economic security, but also with people's daily life, social stability and etc.

With the development of the society, information has become an irresistible trend. Electricity needs higher requirements in the production and management. Modern power system not only deals with large amounts of data, but also makes choices about complex management issues. Therefore, the traditional manual management has been unable to meet the needs of electricity, and it needs a simple way to be managed. Web-based power management system is a good choice. Currently there are many kinds of power management systems but they are not perfect. Each one only focuses on the one aspect of power management. The system of this paper focuses on the management of power data, including people management, person positioning, fault management, maintenance management, order distribution and this functions are relatively comprehensive.

This system uses the most simple B/S design mode. User can operate only with one computer browser. This programme avoids operating database directly and it's simple and efficient. The background using oracle 11g database to manage data and using the most popular tomcat server to provide web services. The entire system is built by SSH web framework.

2. SYSTEM PRINCIPLE

(1). Site hierarchical design

Web development is usually divided into three levels: the view layer, controller layer and data persistence layer.

The view layer is the page what we see, mainly developed with the struts web framework. Struts framework is based on MVC model, separating the display, control and model into parts to improve the code reusability.

The logic layer, which is also the middle layer, includes the service layer and DAO layer. The entire site logic is based on the spring framework. It uses dependency injection, making the logic components are registered into containers at run time which can improve the system maintainability. The use of spring framework AOP (aspect-oriented programming) function, can easily reduce the coupling between the various components of the system. Affairs management is also an important part of the spring framework.

Persistence layer is also known as the data layer, is based on hibernate framework. This layer is aim to completing the main function of the database and achieving CRUD operations.

The relationship between the layers are as follows:

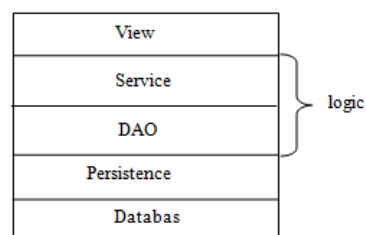


Fig. 1: relationship of layers

3. IMPLEMENTATION

(1). Design of system function

The main functions of the system include the management of registration, permissions, password management; repair entry, scheduling, send a single, view; query results, statistics and reports; personnel positioning, personnel trajectory and etc.

(2). Development environment and development tools

- System development platform: JDK1.6 MyEclipse 6.5
- Database system software: oracle 11g
- System platform: any operating system

- Web server: tomcat 7.0
- The frameworks: SSH framework (struts2 + spring + hibernate), jquery and so on

- (3). The overall design of the site
 A. The structure of the website

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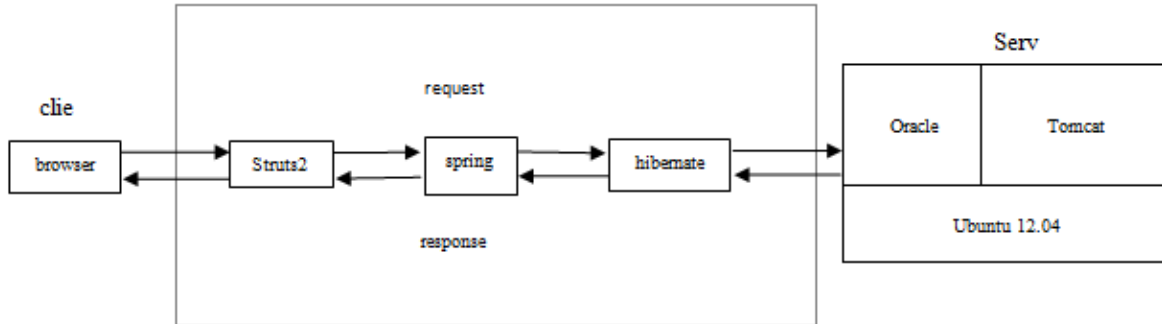


Fig. 2: structure of site

The user send the request by browser. Struct2 fromwork accepts the user's request and then call logic layer components to process. Spring framework rels on it's own IOC and transaction mechanism to manage the middleware. Hibernate operates on the database, send the data back to struts2. Struts2 send the final data back to user. A request / response process is completed in this way.

B. Use case diagram design

There are two roles in the management system currently: administrators and ordinary users. Administrators can create the system users, and grant permissions to users, as well as completing fault management, repair management, distributing orders, positioning people, etc. Ordinary users can only query orders and troubles, person infomation. The use cases diagram for the two roles are as follows:

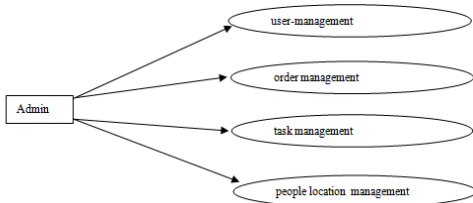


Fig. 3: administritor use case

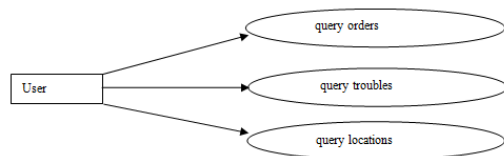


Fig. 4: user use case

C. System flow chart

Firstly the user login on the home page. If the username or password is not correct and the user will get error window. Otherwise user will enter the appropriate management page based on it's authority.

An ordinary user can only query infomation and an administrator can work with order situation, fault situation, personnel and other management. Flow is as follows.

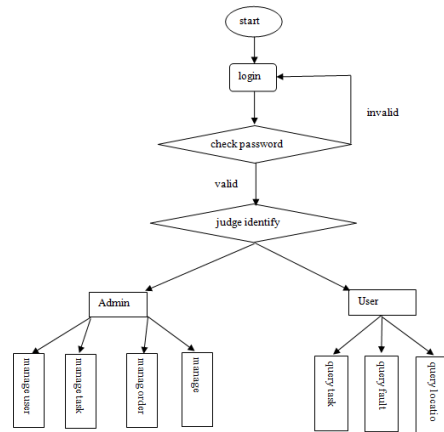


Fig. 5: system operation

4.SUMMARY

This paper designed a smart meter maintenance management system to make it more convient when managing power system. With a simple web site, admin can avoid the complex manual work. This is convenient and efficient. Such technologies can also be applied to the industry more business to improve efficiency.

In addition, the whole design of this site is relatively complex, especially for the design of large sites. It needs analysis, interface arrangement and so on. So in the design, developer must have a logical ideas. Evey layer does their own job and don' s effect others. In this way, development will be easier.

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