Research on Automation Processing of Human Resource Management System in Energy Enterprises

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Abstract. In order to improve the work efficiency of human resources in energy enterprises and realize the integration of internal resources, the paper designs a human resources information management system. Combining with the actuality of human resources in energy companies, the paper uses UML modelling tools to analyse system functions; uses MVC mode to design the overall system architecture to reduce the coupling between layers; the paper uses ASP. NET to deploy the development environment; at the same time the paper uses the WEB browser as the client. Finally, through the test, the information management of employees' attendance, salary, performance and other aspects was realized, which greatly improved the efficiency of human management of energy enterprises.

Keywords: Energy management companies, human resource management systems, system automation, UML modelling.

1. Introduction
As an important corporate sector in our country, the energy corporate sector has made rapid progress today, and related industries have achieved leapfrog development in our country. However, with the expansion of corporate sectors, the distribution of various companies has become increasingly large. Gradually, major drawbacks have appeared in the management of human resources, which are mainly reflected in the wide distribution of the enterprise, the large number of personnel, and the low efficiency of the managers, resulting in high-cost consumption, insufficient management capabilities, and low utilization of human resources. As a result, the traditional management model is no longer suitable for the rapid development of energy enterprise management. Therefore, a new set of management model is particularly important.

Through traditional management experience, we can formulate management systems in line with different realities and adopt flexible and autonomous management mechanisms to directly link employees' work performance with personal salary and promotion, so as to stimulate employees' enthusiasm to the greatest extent, so that employees can get the remuneration they deserve, keep the greatest enthusiasm for work, give play to the individual subjective initiative of employees, and enhance the competitiveness of the company in related industries from the bottom of the development. In addition, avoiding the distribution of companies the location is scattered and wide, and there is a lack of rational implementation standards for the salary of employees in different regions, which reduces the impact of personal subjective willingness on performance appraisal, resulting in...
unreasonable salary levels of employees, and gradually affects the motivation of some employees. Salary management and performance management can't play the role of motivation. With the popularization of computers, using the convenience of computers to improve the efficiency of human resource management in energy companies has become an important research direction in current enterprise management, so that the human resource management of energy companies can be more effectively planned and developed [1]. The human resource management system for energy enterprises in this article has established a set of internal personnel resource management systems suitable for energy enterprises, providing enterprises with functions such as division of authority, management of institutional information, and departmental information management to complete the operation of the human resource management system and support.

2. System UML modelling analysis

By summarizing the related work processes of the human resources department of energy enterprises, it is concluded that the main users of the system mainly include human resources managers, logistics personnel, financial departments, company employees, applicants and other roles. These different people have different roles and job attributes, so as to ensure the operation of the company's human resource management. Therefore, combined with UML modelling tools, the overall use case analysis diagram of the system can be obtained, as shown in Figure 1.

![Figure 1. The overall system uses case analysis.](image)

From the overall modelling analysis in Figure 1, it can be seen that the managers of the human resources department of energy companies are mainly responsible for the company's recruitment, training, attendance, performance, salary, employee management, etc.; the financial department mainly pays based on employees' attendance, performance, etc. Aspects of management [2]. Candidates are mainly responsible for inquiring about relevant recruitment management information so as to conduct interviews in a timely manner.

3. System architecture and system function analysis

3.1. Overall architecture

Considering the security and scalability of the system, the paper adopts the B/S architecture, based on ASP.NET technology and database technology, and uses the WEB browser as the client. The main advantages of this structure are as follows: the user does not need to install the client; the client's
access to the database is realized through the middle layer, and cannot directly access the database, which improves system security; when the business function changes, it can be realized by modifying the application layer [3]. According to the demand analysis of the overall technical architecture of the human resource management information system, application architecture design, and data architecture design, the system can be abstracted into "one centre, five levels, and three systems". These parts logically form an energy enterprise. Human resource management information system and supporting technical support system. The overall technical architecture of the human resource management information system for energy enterprises is shown in Figure 2.

![Figure 2. System architecture.](image)

3.2. System topology

Through the above design and analysis of the entire human resource management system, it is not difficult to see that it is a management system with a large amount of design business and information processing. The development of the human resource management system for energy enterprises designed this time, the main work is to complete the unified centralized processing of various resource information and establish an information centre network [4]. The business process is simple, and the amount of data to be processed is huge. In the centralized processing of information, it is necessary to optimize the configuration of application servers, databases and complicated network equipment. The network diagram of the information centre is shown in Figure 3:
In order to satisfy the system with sufficient scalability and to minimize the investment cost on the hardware, it was decided to use the network topology for the distributed configuration of the hardware part of the system, and use independent physical hosts for the application server and database server. To configure, because the human resource management system developed this time will be applied to the energy enterprise sector, the inevitable problem is that with the continuous development of the enterprise, the future business scope and functional requirements are bound to show steady growth. If now development in order to blindly reduce the investment cost of hardware to meet the design requirements, it is undeniable that the utilization of resources can be maximized, but when the enterprise needs to expand the business content, it seems that if it needs to add content to its own hardware system it is particularly difficult [5]. It is necessary to re-plan the hardware architecture of the entire system, which greatly increases the cost of expansion. Obviously, it is more economical and sustainable to choose an independent arrangement of application servers and database servers for later expansion. In this way, even if there is a large increase in business volume in the later period, you can simply increase the peripheral server to meet the high load and high concurrency requirements.

3.3. System function design

3.3.1. Description of login interface. After starting the human resource system, enter the login interface. Its main function is to verify the legitimacy of users trying to enter the human resource management system. Make necessary settings for the user permissions of the system. After users with different permissions enter the system, the content of operations will be different due to the permission settings, so as to effectively ensure the security of the data and prevent malicious tampering. This function is realized with a drop-down control and a password text box, where the drop-down control can display the user name that has been logged in, which is convenient for the user to log in quickly next time. Use the background database to judge the legitimacy of the user, and finally realize the function of the login interface.

3.3.2. Description of operation main interface. After the user logs in successfully, the system will determine the module functions of the main interface according to the user's authority. It plays a pivotal role in the entire system. Around the window of the main interface, the user enters each module to realize the function. The main interface is mainly composed of a toolbar, a drop-down menu
and a status bar, and uses the third-party control Sidebar as a functional navigation. The functional navigation can be shrunk or hidden to make the interface look more beautiful and generous.

3.3.3. System module description. The information management module includes basic employee information, contact information, department information, job information and personnel change information. Employee information: Employee information is mainly prepared for the necessary prerequisites for the company's personnel flow actions, and provides the company with convenient and fast employee information entry and storage, employee information modification, deletion, query, and report printing. According to the entry of table data by the background database, the data is displayed through the DataGrid View list control [6]. Department information: The employee department mainly manages the department information when the company sets the department, and can quickly extract the department information of an employee. Contract information: The employee contract function provides functions such as adding, modifying, deleting, querying, and printing the contract information data. Job information: The job title of the employee is mainly for the management of the related job title of the employee, adding, modifying, deleting, querying and printing data for the job information of the employee. Personnel change information: Employee personnel changes are mainly for the management of employees’ promotion and resignation information. If there are employees who leave the company, they can enter their information, and their information can also be modified, deleted, inquired, printed, etc.

4. System implementation
The workflow management subsystem is mainly responsible for process definition, update, deactivation and start-up. The realization of work flow adopts the open-source workflow Activity. The activity plug-in is installed in Eclipse. The core of the entire Activity as the flow engine is the Process Engine object. Generate various instances and data when the process is running, and supervise the operation of the process. Almost all operations start from the engine, so the engine is generally set as a global variable. Workflow is used to complete the management of platform process information. The administrator can add, modify and delete the process data, and display the process information list. After employees enter the workflow management subsystem, they have the following functions: adding workflow, workflow management, adding process nodes, process node management, process node subordinate nodes, and process node subordinate node management. This module is the effective management of process information in the platform [7]. The administrator can update, add or delete the process data, and display the process in the form of a list.

After the employee basic information management page, the information to be entered is the basic information of the process, including process name, process code, process type, and process description. When the input is completed and click Submit, the system will verify the content. If the process data is not the same as the front-end user fills in, the system will use the Request object to store the incorrect prompt information, automatically enter the process information webpage, and prompt incorrect information. Corresponding processing will be made after filling in accurately. After the SQL statement is organized, the public database access class is called and the corresponding business processing is made. The data access layer must be passed when the node data is updated. The working interface of the workflow management system is shown in Figure 4.
5. System test
The overall system internal test cycle of the energy enterprise human resource management system developed this time has gone through about 90 days. The system code totals about 12,000 lines. The comment content is detailed in more than 300 lines of comment content. The amount of system code reached about 18,000 when packaged. The number of rows, the total number of defects found, the number of effective defects, and the number of repaired defects during the test are 109, 116, and 133 respectively. Other potential problems need to be updated and repaired during later use.

6. Conclusion
This article attempts to pass ASP.NET and sql server 2017 database and other computer development technologies, with energy companies as the background of system development, designed and implemented an information management system that can be used for human resource management and office work in energy companies, which greatly provides the automation office level of energy companies. It provides a new reference and reference for the application of information technology.

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