

Implementation of Mine Equipment Maintenance Management System based on Web

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Abstract—Based on Web of mine equipment maintenance management system, mainly to solve the mining equipment safety inspection, repair and test equipment, the existing problems of mine machinery and equipment maintenance is lack of effective management means information. Based on the introduction of mine equipment maintenance management system using database technology, network technology and the Web, this paper expounds the mine equipment maintenance management system structure, function, design, functions.

Keywords- Web; equipment management; database model

I. INTRODUCTION)

The maintenance management system of mine equipment which plays a vital role in the safe production of mine is an important part in the production and management of mine. The maintenance management is a management operation which is to repair and make the equipment operating. With the rapid development of information technology, the network information management system platform has been established by mine enterprises in our country. In this article, the research is for the establishment of mine equipment maintenance management information system, whose aims are achieving the informational management of mine equipment maintenance information, sharing of equipment resource and communicating of technology. Based on the theoretical research of the ways of equipment maintenance, the author of this article introduces the basic ways of mine equipment maintenance management, planning maintenance, inspection, state maintenance and so on. Mine production is a reliable production system, which is organized by various equipment of every production processes. [1]It is of great importance for a complicated equipment system to maintain it, so the maintenance of management system is adopted that can minimize the maintenance costs and downtime. The mine equipment maintenance management system based on Web, with the application of object-oriented analysis and design, designs concrete structure and function modules on the supporting structure of B/S. Microsoft SQL Server 2000 database is applied to store the data which analyzes the achievement of ASPNET technology and C# programming language based on the mine equipment maintenance management system based on Web. And it also introduces the connection of database and interface function module,

and the setting of maintenance management system Web server. On these operations above, the application and test of the mine equipment have been achieved.

II. DESIGN OF SYSTEM SOFTWARE

The mine equipment maintenance management system based on Web is accurately based on the system module of the connection between B/S and C/S, whose software structure is as follow in figure 1.

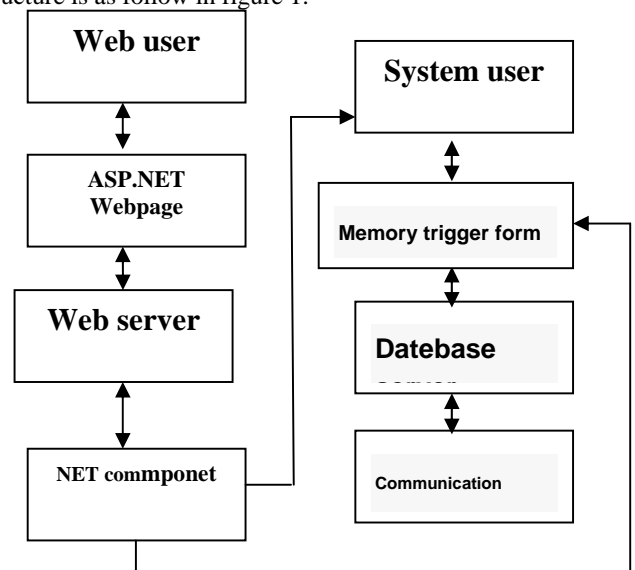


Figure 1. Figure 1 System Software Structure

B/S model and C/S model connect with Internet with struts frame structure and net server components. By C/S module, the relationships have been connected, and the client terminal operates modules by database to connect the database in the database server. B/S module and C/S module are independent in structure, connected with database and have the same data server. When the database messages are altered, the B/S and C/S are also altered. The network communication finishes the connection of all monitoring positions under the well and sends the detecting data to the data server. Then, the information module which refines and analyzes the reflected data summarizes the information and sends them to the server.[2]

A. Mine equipment management information system

In the mine production process, lots of equipment equipped with various parts which are expensive, should be combined together to use. Because of the ever-changing geological environment and complicated conditions, the mine production equipment operating well or not influences directly the mine production safety. Mine equipment management aims to arrange the equipment effectively, control production operation, and prolong the service life. Mine equipment maintenance management system centered with the safe operation and use of mine equipment, has the responsibility to monitor and make decisions to all machine equipment that provides the reliable production equipment to the effective production of mine.[3] Mine equipment management information system adopting the management concept of life cycle, analyzes the economic life cycle of equipment and considers comprehensively the life cycle and utilization value in order to maximize the utilization rate. The mine equipment maintenance management system based on Web can be divided into three levels: maintenance plan, maintenance program and maintenance feedback. Maintenance plan refers to make periodic security checks to the machine equipment. Maintenance program refers to the strategies of confronting production equipment problems. Maintenance feedback refers to the responding reference of machine equipment operating well after maintenance. It aims to reduce the maintenance costs and improve the efficiency.

B. Developing tools of system

The system adopts Microsoft Windows2000 Serve as the network system server, and Windows XP as the client terminal, Windows NT operating system of Microsoft Company, Web server and Internet information data server. IIS database information server adopts SQL Serve2000. The mine equipment maintenance management system based on Web takes mine production requirements as the aim, designing and developing the modules which have the functions of cost control, information feedback and maintenance and management to reach the targets of convenient managing, efficient operating, safe and reliable and friendly interface. The mine equipment maintenance management system based on Web can efficiently achieve the standardized management of equipment, maintain the safe production of mine and control the resource effectively, and analyze dynamically the equipment life cycle with equipment encoding management mechanism. The mine equipment maintenance management system based on Web tracks the use of mine equipment in real-time through the equipment purchasing arrangement,[5] storage management, and maintenance feedback and repairing. Equipment maintenance administrator is able to query all operating process of machine equipment so that the equipment parts, repairing, use of equipment and parts configuration can be managed scientifically and efficiently. Mine safety management system includes five functioning modules:

1) System maintenance management

System maintenance management mainly modifies, increases, updates and deletes the user's information and equipment data. It also checks the equipment's using information to facilitate the management of equipment data information files. Ease of Use.

2) Production safety management

Production safety management includes three main aspects: employee safety management, environment safety management and equipment safety management. The manager can grasp the whole safety situation of mine efficiently with production safety module. Production equipment is an important part in mine production so the quality of equipment can influence the safety production of mine. The operation of machine equipment is an important part in mine safety management. Because of the ever-changing situations in producing mine under the earth, work safety management is also very important in safety management. [4]

3) Emergency maintenance

Mine safety management is very important, because in the accident, the efficient emergency strategies are needed which includes the methods of hedge, rescue and mutual rescue, and the usage of equipment. In some accidents needing some special treatment, rapid response and timely and efficient remedy measures are taken, and scientific and efficient methods are adopted to reduce the casualties and economic losses.

4) Safety warning

The safety warning measures of mine production mainly include cutting electricity, checking abnormal alarming, switching state alarming and equipment damage alarming. Users can make decisions manually or automatically according to the concrete alarming categories. Safety testing can test all equipment's working situation timely.

5) Accident management analysis

The efficiency of accident management can influence the predicting work of safety production directly. Accident management environment includes the management of casualties and the analysis of casualties' statistics. Casualties' accident management analyzes the accident with scientific statistics that have great reference value to avoid occurring accidents.

C. Database design of maintenance management system

SQL server2000 used to store and manage the mine equipment maintenance information, is adapted to the database of the mine equipment maintenance management system based on Web. SQL server2000 analyzes efficiently and organizes the data in equipment maintenance that improves the equipment's usage rate and provides help to mine production, meanwhile in key words the basic information and data attribute are combined together. According to the functions of system, the data information in database can be mainly divided into the following five parts:

1) System users' sheet

Distribution system users; modifying, increasing, updating and deleting the user's information and equipment data; checking the equipment's information; managing conveniently the equipment information materials.

2) *Equipment information sheet*

Equipment information sheet numbers and manages all machine equipment in the mine production process that can check, repair and manage conveniently all equipment.

The managers also check conveniently the safety conditions of the machine equipment.

3) *Maintenance information sheet*

Maintenance information sheet includes the maintenance records of problems in the production process, such as maintenance cycle, configuration of the parts used, on stock or not, registration of the lacking parts and update of parts timely that can conveniently facilitate the machine equipment.

4) *Information feedback data sheet*

Information feedback data sheet, the re-evaluation of equipment maintenance includes the maintenance cycle and problems that can conveniently monitor the equipment faulty.

5) *Maintenance technology management sheet*

Maintenance technology management sheet mainly includes maintenance personnel and repairing parts.

III. DEVELOPMENT TOOLS AND THE SELECTION OF DATABASE

The mine equipment maintenance management system based on Web adopts ASPNET technology as the development tools used for the Web interface to design and development system. The system uses dynamic Web design technology of ASPNET, which can manage the data information safely and steadily, and facilitate the achievement of data modeling and procedures. SQLServer2000 database is adopted by the background service which can set up a safe and steady database. With the combination between ASPNET technology and SQLServer2000, we can set up a safe and efficient equipment management system which operates simply, reflects quickly, operates steadily and maintains conveniently. Mine equipment maintenance management system plays a vital role in the machine equipment's safety

production, controlling the mine accidents and improving the production efficiency of mine.

IV. CONCLUSION

The mine equipment maintenance management system based on Web mainly used to finish the safety testing, maintenance and detection of mine equipment. The current problems of mine equipment maintenance management are lacking of efficient information means, information dispersed and information resource unshared. Mine equipment management system is used in net platform to monitor the operation of mine equipment and facilitate the maintenance and well working of mine equipment. Mine equipment management system, centered with the safe operation and use monitors and makes decisions about the maintenance and repair of all machine equipment that provide reliable production equipment for the efficient mine production. Mine equipment management system adopts the management concept of life cycle, analyzing the economic cycle, considering comprehensively the life cycle and usage value of equipment that can maximize the usage rate of mine equipment..

REFERENCES

- [1] Ma Kai, Liu Yinggang, Zhang Xiaofeng. "Design and Application of Airborne Wet Dust Removal System", *Mining Machine*, PP.55-56, 2010.3; (*references*)
- [2] Zheng Jianming. "Research and Development of Mine Equipment Management System based on C/S module", *China Mining*, PP.61-69; 2007,10 (*references*)
- [3] Luo Bingyang. "Research on Mine Monitoring System Software Design", *Journal of Wuhan University of Technology*, PP.27-29; 2007,10 (*references*)
- [4] Dong Xiaolei. "Research and Application of Mine Equipment Management Information System", *Mining Machine*, PP.80; 2008.5 (*references*)
- [5] Zhou Liqun. "Research on Monitoring and Maintenance of Mine Equipment", *Science and Technology Information*, PP.40-48. 2010.9 (*references*)