

Design and Implementation of Information Database Management System for Coal Machinery Enterprise

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Abstract: The production, supply, sale, human, money and material in coal machinery enterprise are an organic whole, and there are a lot of information exchanges between them. However, manual management information is dispersed and lack of perfect basic data. Information is scattered, not timely, inaccurate and unshared, which greatly affects the scientific nature of management decisions. In this paper, based on the investigation and analysis of the information of coal machinery enterprise, the information of coal machinery enterprise is classified in detail. Using Visual Basic 6 as the main development tool, this paper focuses on the basic principle and process of the development of the coal enterprise information database management system. The database management system can realize operation and management of basic information of coal machinery enterprise. Users can get information quickly through this system. It will lay a foundation for informatization of coal machinery enterprise.

1. Introduction

China is the world's largest producer and consumer of coal. However, the coal machine manufacturing industry, which produces coal mining equipment, is generally low and extensive. The main equipments of large mines with an annual output of more than 5 million tons are almost monopolized by large foreign companies. As an important part of the coal industry, with the deepening of the reform and the development of the market economy, the coal machinery enterprise is gradually facing the market to implement the order production. One of the most prominent problems in the Chinese coal machinery industry is that the comprehensive production capacity is weak and the market competitiveness is not strong [1].

In the current coal machinery industry, information transmission lags behind. Information distortion and other result in slow production, time delay, decision-making errors and customer judgment errors. All these cause the enterprise's economic losses and hinder the overall development of the coal machinery industry. The production, supply, sale, human, money and material in coal machinery enterprise are an organic whole, and there are a lot of information exchanges between them. However, manual management information is dispersed and lack of perfect basic data. Information is scattered, not timely, inaccurate and unshared, which greatly affects the scientific nature of management decisions.

The application of information of coal machinery industry in China is mainly based on information technology in ERP, EAM, OA and other business links. Most of coal machinery enterprises have not yet carried out the implementation of the overall informatization. It is only in the core work link to carry out the construction of information, which covers a limited range [2]. The small and medium-sized coal enterprises are affected by the subjective and objective factors, such as manpower and financial resources, and the long-term and arduous road of state-owned enterprises transformation, which primarily stay in the traditional design system. For small and medium-sized coal enterprises to organize their internal activities efficiently, it is necessary to establish a management information system which is suitable to their own characteristics.

The Information database management system of coal machinery enterprise is developed

according to the need of enterprise information construction and realization of manufacturing informatization. According to the research of the information management system of the existing coal machinery enterprise, the information of the coal machinery enterprise is classified and the system flow is analyzed, and then the coal machinery enterprise information database management system is designed. The system selects the SQL Server 2008 database system and the Visual Basic 6 as the main development tool, which can be connected seamlessly with the database. The information database management system of coal machinery enterprise can realize the operation and management of basic information of coal machinery enterprises. Users can obtain information quickly from this system. It will lay the foundation for the informatization of the coal machinery enterprise.

2. Information Analysis of Coal Machinery Enterprise

Manufacturing information can be divided into two parts according to its requirements [3]: product manufacturing information and enterprise service information. Usually, the information in the medium and small coal machinery enterprises contain the basic market information (such as market demand, goods circulation, marketing creation, capital circulation and production supplies, etc.) and enterprise information (such as management, product development, product process, production planning, quality control, personnel quality, production conditions, and the product cost, etc.). According to the research and investigation of coal enterprises, the information of coal machinery enterprises can be classified as follows:

- (1) Employee information: including the employee's number, name, birthday, sex, nationality, work experience, working hours, personal resume and other basic information.
- (2) Department information: including department category and department number.
- (3) Equipment information: including equipment number, equipment name, and equipment type.
- (4) Material basic information: including material name, material type, material price, quantity of goods and other information.
- (5) Customer information: including all basic information about customers and suppliers,
- (6) Inventory information: including equipment and materials out of the warehouse and inventory information.
- (7) Asset information: Including basic information about the fixed assets and current assets of the enterprise, as well as the employee's salary information.

3. Overall design of information database management system for coal machinery enterprise

3.1 Design of system function module

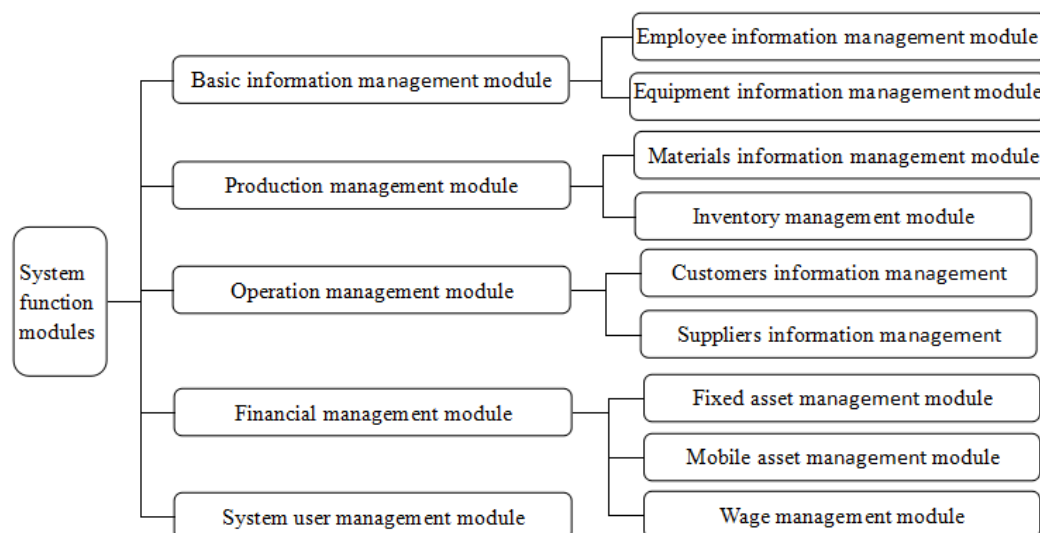


Figure 1 specific functional modules

Modular programming is used to facilitate the combination and modification of system functions. It has the function of database maintenance, and can timely add, delete and backup data according to the needs. The functional modules are designed according to these requirements. The main function of the information database management system for coal machinery enterprise are to input, query and modify basic staff information, basic equipment information, material management, asset information, customer information and so on. Therefore, the system is composed of basic information management, production management, operation management, financial management, system management and other modules. The specific functional modules are shown in Figure 1.

After analyzing the needs of the coal enterprise information database management system and the function structure of the system, the database entity object and the entity E-R diagram used in the system are planned.

3.2 Database design

3.2.1 Database requirement analysis

The system is designed to meet the requirements of the coal enterprise information management system. So it requires to record employees, equipment, storage, suppliers, customers and operation information in all aspects of financial management, including the addition of various kinds of information, and to modify and delete operations. Moreover, all users are allowed to query above all kinds of information [4]. In addition, some auxiliary data tables must be established to provide corresponding data sources for these operation information, such as employee information, department information, and some material information of stock. Through these analyses, the database design of the system must meet the following points:

- ✧ To record detailed information of employee.
- ✧ ☐ To record simple information of department, position.
- ✧ ☐ To record detailed information of equipment.
- ✧ ☐ To record detailed information of suppliers and customers.
- ✧ ☐ To record detailed information of in-out warehouse and inventory of materials.
- ✧ ☐ To record detailed information of employee wages statistics.
- ✧ ☐ To record detailed information of fixed assets and current assets.
- ✧ ☐ To record the basic information of the users of the system and set permissions operating information.

3.2.2 Data structure analysis and design of data table

According to the actual requirements of the various functional modules involved in the system, the database to be established should include the following contents: (1) user information table (Userinfo) (2) employee basic information sheet (manrecord) (3) device type information table (tblTypeInfo) (4) device information table (tblDevice) (5) borrowing and lending information table (tblLend) (6) department information table (tblDepartment) (7) attendance record (TBL_WORK) (8) attendance category table (TBL_TYPE) (9) job role table (TBL_ROLE) (10) monthly salary settlement record (TBL_PAY) (11) fixed assets table (TBL_FIXED) (12) reimbursement category table (TBL_CURTYPE) (13) current assets table (TBL_CUR) (14) supplier information sheet (suppliers) (15) customer's basic information form (customers) (16) outbound information sheet (Muse) (17) inventory information table (msurplus) (18) warehousing information table (msave) (19) material.

3.2.3 Logical relationship between data tables

The logical relationship between the table and the table [5] is formed according to the relationship between the entity and the entity. According to the requirements for the column specification and the relationship between the main foreign keys, the logical diagram between the data tables is shown in Figure 2.

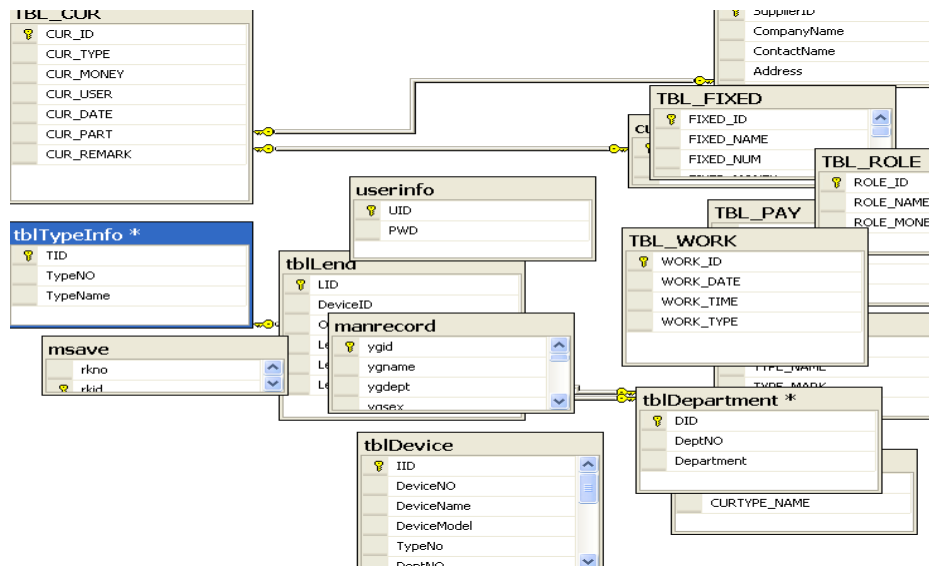


Figure 2 The logical relationship of the data table

4. Implementation of database management system

VB 6.0 is used to develop this information database management system. First, add a module Module for the project in the project resource manager of VB 6.0, which is saved as Module1.bas. This part mainly includes the definition of some public variables, the definition of main process, and the code design of automatically restoring the backup database files to SQL Server 2008. Then the main interface, the landing interface, the user management interface, and the design of the form of other interfaces and the creation of the code are carried out. A similar approach is used for each functional module design. The main interface of the system and the functions of each function module are shown in Figure 3.

In the main interface, through menu basic information management, users can realize employee information addition, staff information modification and query employee basic information. User can enter the device management module, through the menu basic information management-device information management, which can complete the operation of adding, deleting, cancelling, and so on. User can add, modify and query material basic information through the menu production management-material basic information management module. Other information management functions can be realized through corresponding modules.

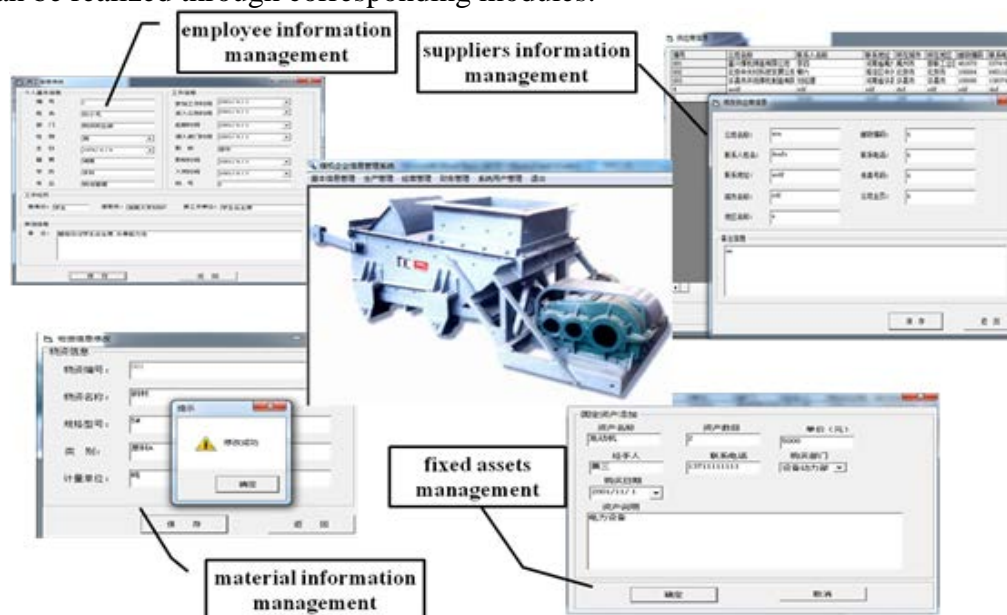


Figure 3 The main interface of the system and the functions of each function module

5. Conclusion

The information database management system of coal machinery enterprise developed in this paper is simple, easy to operate and easy to use. Through this system, the basic information management, material management, human resource management, financial management and market information management have been realized, which has effectively improved the work efficiency and reduced the management cost. Secondly, in database management, it provides convenience for people who need to know the coal machine industry, ensures the timeliness, accuracy and speed of inquiry, and lays the foundation for coal machinery enterprises to achieve informatization.

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