Planning and Design of Enterprise Management Information Systems Based on Artificial Intelligence

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Abstract: The development of artificial intelligence technology has promoted innovation in the operation mode of enterprise information management systems and optimized the intelligent scheduling and allocation of enterprise resources, thereby improving the accuracy of project management. In addition, through data analysis and prediction functions, it provides precise decision-making support for enterprise project managers, helps them identify risk factors in enterprise development, proposes targeted measures, and reduces development risks. Therefore, this paper designs an enterprise information management system based on artificial intelligence, hoping to provide references for relevant researchers and practitioners.

***Keywords*:** Artificial intelligence; Enterprise management; Information management; System planning; System design

1. Introduction

With the continuous development of modern social economy, China's comprehensive national strength has been enhanced, and the country has gained a certain degree of influence worldwide. Such achievements are attributed to the development of China's science and technology. Since the 21st century, emerging technologies such as artificial intelligence have continuously appeared. Against this background, China has been ushered into the era of artificial intelligence, and various information resources have also been expanding. How to effectively manage information and fully explore the value contained in information has become particularly important. Therefore, it is necessary to establish a sound information management system. This is not only a requirement of the era but also a major measure for China to cope with the social environment. This paper focuses on the application of artificial intelligence technology in enterprise management information systems to ensure their stable development[1].

2. Hierarchical Structure Planning of Enterprise Management Information Systems

This paper adopts the J2EE data transmission architecture to design the enterprise management information system. This architecture is composed of multiple components, which can simplify system deployment and development processes. Based on technologies such as Artificial Intelligence (AI), Mobile Communication, and Internet of Things (IoT), and combined with enterprise business needs, the enterprise management information system is established. As a complex and wide-ranging integrated information system, it takes recovery, fault tolerance, and monitoring as key considerations to improve business processes. Figure 1 shows the architecture of the enterprise management information system. The hierarchical structure of the system is divided into:

(1) Data Layer. In future development, the production and management modes of enterprises will continue to evolve. Therefore, incorporating interactivity into system design facilitates system expansion and updates.

(2) Business Logic Layer. System operations are implemented using persistent accessors, and JDBC APIs in the database are used as application programs to store and process data in standard ways. Developers design various types of persistent storage, including API functions and access mechanisms, based on the role of SQL statements in JDBC.

(3) Control Layer. In the hierarchical structure design of this paper, the control layer operates on the same concept as the MVC controller. The controller prevents the coupling of business data expression and logic, although it cannot process data. For example, after a user clicks a link, the control layer receives the request but does not handle the information. Instead, it passes the user's request to the model, simplifying the model process and meeting view requirements, then feeds control-layer information back to the user. In system design, different user requests are filtered and converted into event objects for transmission to the system's middle layer.

The main function of the system control layer is to simplify the structure of business dispatching and to dispatch business tasks. It allocates corresponding services to different subsystems, enabling log management and permission control. For different subsystems, corresponding control layers are assigned, although the overall architecture remains the same. Therefore, multiple common classes should be integrated into the same package to facilitate system maintenance and

expansion during enterprise development[2].

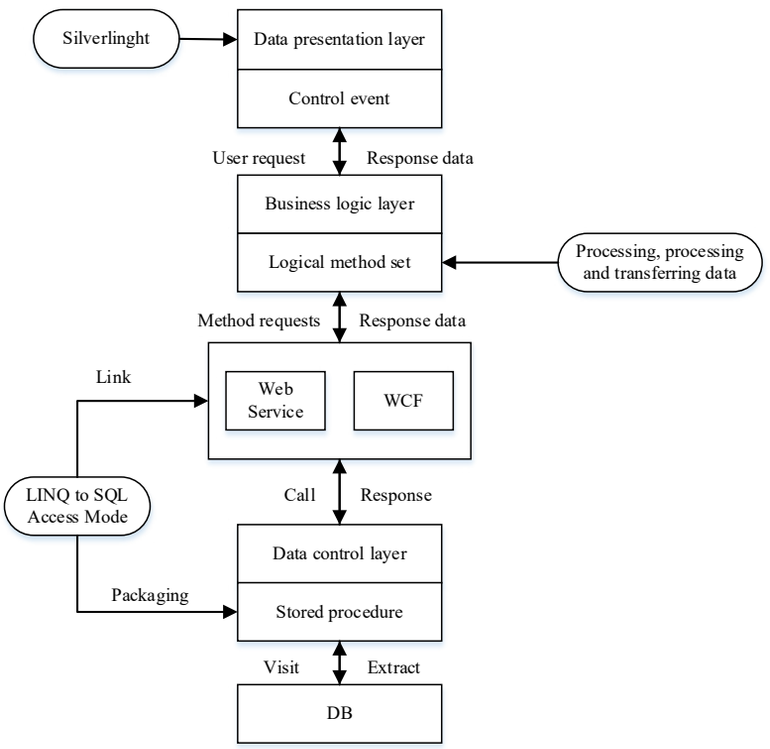

Figure 1. Architecture of the Enterprise Management Information System

3. Hardware Selection for the Enterprise Management Information System

Based on the planning requirements of the system's hierarchical structure, the main hardware selections are as follows:

3.1 Selection of Application Server

To fully consider the system's later operation, maintenance, and development, this paper selects the LR2124-2G 2U12 model server. This server has high operating performance, enhances computing capability, and stores data. It also supports two central processing units, has 32 DR4 DIMM slots of single memory, a VGA D-sub interface, and a 1600W redundant power supply. This application server can meet daily operational requirements.

3.2 Selection of Data Converter

To ensure that the system designed in this paper can effectively identify data in enterprise operations, an AD data converter is used to convert digital quantities of the enterprise into analog quantities. The main hardware components of a digital-to-analog converter include an operational amplifier, reference unit, and analog switch. This paper uses the CS43198-CWZR 32-bit AD converter, which can meet the actual needs of the system. The main configurations include: temperature range: –10 to 65°C; digital power supply and analog voltage both at 1.66–1.94V; built-in audio bus (I2S) in the integrated circuit; 16-bit frequency; and 2.3 MW power consumption.The use of this converter can transform system digital signals into multiple levels, and when digitally paralleled with a two-stage AD converter, it adjusts conversion speed, reduces resolution and component quantity, and ensures stable and normal system operation[3].

4. Software Functions and Design of the Enterprise Management Information System

4.1 Software Design Principles

The system software program is designed based on corresponding principles to promote software development and improve system scalability and maintainability. The main principles include:

(1) Single Responsibility Principle. For example, in the system's product classification management, only classification work is performed. Before classification, query invocation should be unified to avoid unnecessary complexity in the system.

(2) Open–Closed Principle. By creating an abstract framework for system scalability, detailed functions of the system can be extended. For instance, employee information in the system can be designed as an abstract class, which also includes information about resigned employees, thus ensuring diversity of employee information and system maintainability.

(3) Dependency Inversion Principle. Interfaces and abstract classes are used to achieve dependency among functional modules, avoiding direct coupling and reducing workload caused by module changes.

(4) Interface Segregation Principle. By refining system interfaces, the flexibility of system programs is improved[4].

4.2 System Management Module

This module belongs to the authority scope of enterprise administrators. Its main functions include adding users, determining roles, and granting permissions. It is further divided into role management, user management, and resource module management. Through user management, new users can be added by entering information such as username, account, gender, and contact details, and existing user information can be deleted, modified, or queried. Role management assigns descriptions and permissions to different roles. The resource module management function allows querying existing resource modules and performing editing, modification, or deletion.

(1) User Management Module. When adding a new system user, the administrator sends a Notice request to the system, searches for matching files, and sends the required commands after accessing the objects. Once the command is completed, the execution result is displayed on the interface, facilitating viewing and management.

(2) Role Management Module. This module allows assigning role management and permissions within the system. Figure 2 shows the specific permission allocation process.

(3) Resource Management Module. In this module, administrators can modify, edit, or delete resources. The process is the same as that of the role management module and can be referenced in Figure 2.

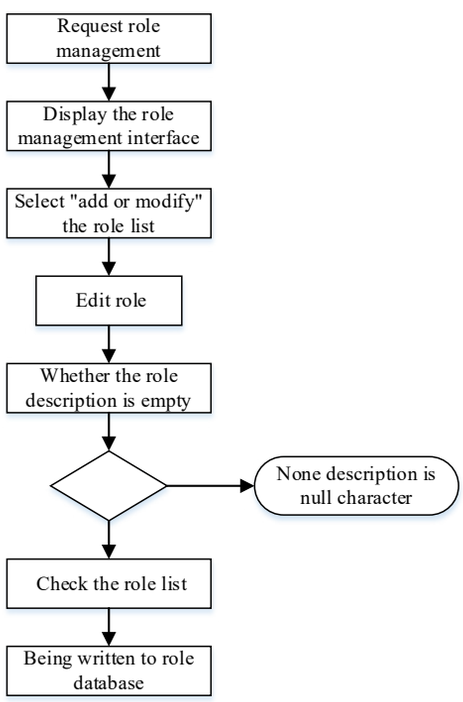

Figure 2. Detailed Permission Allocation Process

4.3 Financial Management Module

After logging into the system, personnel from the enterprise finance department can use the financial management module to complete functions such as statistical reports, sales personnel management, product pricing, and agent settlement:

(1) Product Pricing. Staff modify the unit price of finished products in enterprise inventory based on external factors such as market demand and raw material prices.

(2) Sales Personnel Management. Personal information of enterprise sales personnel can be modified.

(3) Agent Settlement. Payment and settlement data of enterprise order agents can be managed.

(4) Statistical Reports. The main function is to count the value and quantity of raw materials, finished products, and

orders, thus reflecting the enterprise's operational and financial status.

All functions of this module are implemented through the Orders, Products, and User classes in the business logic layer. The product pricing function corresponds to the ProductSelect() method; sales personnel management corresponds to the UserInfoUpdate() method; agent settlement corresponds to the OrderSelect() method. The management process of sales personnel is integrated with the user management function of the system management module[5].

4.4 Sales Management Module

The main function of this module is to edit and maintain information related to enterprise orders and associated business partners. Specifically:

(1) Business Partner Order Management. By entering relevant information such as the partner company's name, address, tasks, and salesperson, enterprise sales staff and management personnel can add related information about business partners into the system.

(2) Order Information Management. By entering order information into the system, new orders can be added, such as order amount, order number, etc., and the information can be queried, edited, and modified. Financial supervisors can perform operations on deleted orders to improve sales management effectiveness.

Enterprise leaders and responsible managers can use this module to analyze the company's actual business situation and assist in further planning and decision-making. After successfully logging into this module, order viewing and adding functions in order management involve corresponding database table functionalities. Through the order-adding interface, new information such as agent name, inventory cost, and order number can be generated. Only after completing the integrity and accuracy review of the order information can the information be submitted; once approved, it is inserted into the system database table.Through the agent management function, information modification, viewing, and agent addition can be achieved. The customer viewing function includes viewing, adding, and modifying customer information, all of which involve database tables.

4.5 Human Resource Management Module

Using the human resource management module, functions such as employee resignation information management, position information management, and employee information management can be realized. The main implementation codes are shown below. The specific functions include:

(1) Employee Information Management. By entering and saving employee information in the system, functions such as adding, modifying, and viewing employee information can be completed.

(2) Resigned Personnel Information. The main functions include viewing, deleting, and adding information of resigned employees.

(3) Position Information Management. Through functions such as adding position names and descriptions in this subsystem, information can be edited, added, and viewed.

Through this functional module, the workflow of the human resource management department can be simplified, administrative workload can be reduced, and work efficiency and quality can be improved.

```
-- Department Position Table
CREATE TABLE department_position (
    department_id SERIAL PRIMARY KEY,
    department_name VARCHAR(255) NOT NULL,
    parent_department_id INT REFERENCES department_position(department_id),
    position_name VARCHAR(255),
    position_level INT,
    manager_id INT
);
-- Work Location Table
CREATE TABLE work_location (
    location_id SERIAL PRIMARY KEY,
    location_name VARCHAR(255) NOT NULL,
    address TEXT,
    capacity INT,
    default_calendar_id INT REFERENCES work_calendar(calendar_id)
);
```

4.6 System Security Management

To ensure the security of enterprise information, this paper adopts defensive strategies to prevent malicious network attacks. At the management level, asymmetric encryption is used to guarantee encrypted data transmission. At the application level, during data network sending and receiving, data mining technology is combined with information fusion technology to predict data security risks, extract statistical features, and identify network risk data. To improve data mining efficiency, data quantification is achieved through filtered item sets to control security vulnerabilities.

During the design process, different modules have distinct roles and operate independently. Figure 3 illustrates the principle of system intrusion detection. By implementing system intrusion detection, an alarm system is established, enhancing the system's detection capabilities. Network probes collect system data, and after analyzing the data, alarm information is sent to the intelligent control module. Upon receiving this information, the intelligent control module integrates it with data from the intelligent processing knowledge base to formulate response plans to resist security attacks. An automatic tracking module records network attacks in real time, including network forensics, network traps, and trace positioning, thereby improving the system's defense capabilities[6].

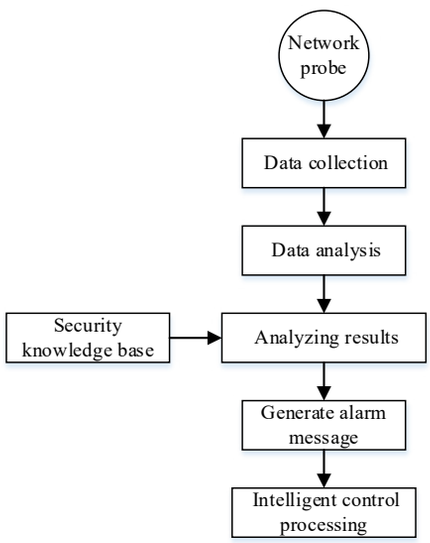

Figure 3. Principle of System Intrusion Detection

5. Conclusion

The enterprise information management system designed in this paper includes both software and hardware functional modules. When applied in actual enterprise operations, the system can achieve online integration of internal and external resources, improve operational efficiency, and promote the development of enterprise informatization.

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