ERP System in the Logistics Information Management System of Supply Chain Enterprises

Qingping Li and Guoqiang Wu

School of Economics and Management, Huainan Normal University, Huainan 232001, Anhui, China

Correspondence should be addressed to Guoqiang Wu; wgq@hnnu.edu.cn

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In the era of rapid development of information, with the popularization of computers, the development of science and technology, and the continuous growth of IT technology and business, the enterprise resource planning (ERP) system has become a platform and guarantee for the completion of business management processes after long-term operations. Establishing a logistics management information system is an important means for Chinese companies to improve their logistics efficiency. This is the prerequisite for modern companies to gain a competitive advantage in the management of logistics companies. Therefore, organizations must adapt to different needs, fierce competition, and rapid strategic changes. This is a powerful supplement to the nature of logistics companies. The logistics management information system has continuously experienced the processes of MRP, MRP II, and ERP. This article aims to study how to use computers in logistics management to create an ERP system-based enterprise logistics information management system. This article puts forward the development significance of logistics information management system, uses ERP system to analyze complex logistics business in detail, and designs the overall framework, specific functions, and data model of the system in detail. The experimental results of this paper show that the ERP system has important application value in the logistics information management system of supply chain enterprises, and it can effectively increase the value of customer satisfaction by 86.7%.

1. Introduction

With the rapid development of human society, people’s social work isolation has improved, and the relationship between enterprises has become closer. In order to provide more transportation and higher data management for cooperation between enterprises, especially with the rapid development of the industry, logistics information management based on information, automation, network, and intelligent information is the most important feature of modern logistics information management. With the continuous development of logistics enterprises, the company’s logistics information management has also developed day by day, and related operators have become more and more important. At the same time, modern business development is inseparable from many partners in today’s business management. The entire business supply chain is an object that enterprises need to pay special attention to in supply chain management. Knowing the resources, information, and data of suppliers and customers in a timely and accurate manner and extracting valuable information from relevant information to provide customer service is an unparalleled effective support condition for enterprises in competition. Logistics services are an indispensable part of corporate services. It is essential to improve the competitiveness of the organization. The development of science and technology has brought about a fundamental change in the competition of traditional companies, which is no longer the traditional competition of geographical regions. Good logistics management methods can significantly reduce logistics management costs and improve the value proposition of the business. Today, economic globalization is growing faster, and the depth and breadth of commercial product
development are also increasing. This puts forward new requirements for organizational development, requiring organizations to meet their needs. At the same time, enterprises need to continuously improve, improve competitiveness, improve logistics management methods, and improve logistics management levels [1].

By studying the current status, existing problems, and actual needs of the current logistics management system, we design a management information system for logistics management. It helps to accelerate the automation of logistics management, and the rapid development of computer applications leads to the development of business management. Increasing social competition and widespread use of information force companies to adapt to social trends and require management automation to improve the competitiveness of industry organizations. With the development of China’s logistics industry and the development of traditional self-recording methods that the company cannot cover, this is also conducive to improving the efficiency of logistics management business processing. The company’s business needs are increasing, and customers want speed and the most accurate service. It has also become a standard for customers to evaluate companies, so how to improve business processing efficiency and management has become a key issue hindering the development of manufacturing companies. The system can help organizations build a comprehensive logistics system, which plays an important role in improving employee productivity and managing logistics automation.

Jagoda and Samaranayake put forward the conceptual framework of ERP system implementation by combining the state gate method with the preimplementation roadmap. It is found that an alternative integrated method based on the phase gate method is proposed to implement the enterprise resource planning (ERP) system, which will enhance the effectiveness of the ERP project [2]. However, it is far from enough to build a conceptual framework. The theory and practice should also be combined. At present, choosing the right enterprise resource planning (ERP) system is the main challenge facing business managers. Jafarenej A proposes a combined multicriteria decision (MCDM) method [3], which will determine the most important use of Shannon entropy technology for ERP selection standard. Through this method, the previous research results can be integrated, and the judgment of industry experts or organizational managers can also be integrated to select the appropriate ERP system [4]. However, this method only discusses the choice of ERP system and does not have an in-depth understanding of how the ERP system is applied. Many researchers have studied various key success factors and different reasons for the failure of ERP implementation projects. Although there are detailed literature forecasts, the purpose of this research by Aleksander is to develop and evaluate the main human factor (PHF) model and confirm the significant impact of PHF on the success of traditional CSF and projects [5]. However, the development of the main human critical success factor model for the implementation of the ERP system is by no means simple, and the feasibility of the study is not high.

The innovation of this article is as follows: (1) Due to the drawbacks of the traditional logistics information system and ERP system, the logistics function of the ERP system has been strengthened, so that the logistics information management system based on ERP not only has strong logistics processing capabilities, but also maintains the ERP system. Other information processing capabilities are as follows: (2) The development and implementation of an ERP-based logistics information management system not only reduces the operating costs of the logistics business system, but also reduces logistics costs.

2. Research Method of ERP System in Supply Chain Enterprise Logistics Information Management System

2.1. ERP System. Enterprise resource planning is a combination of modern advanced information technology and systematic management concepts based on supply chain-oriented management ideas (integrating relevant parts and their various links into its operations) [6–8]. By closely integrating business and construction processes with the supply and demand system, plan, design, and control the company’s logistics, capital flow, work flow, and value-added flow, etc., and rationally arrange the organization’s production, supply, and marketing activities, so that the organization can use all resources in a timely manner. It is an integrated information management system and management platform that supports the organization’s decision-making, production, and operation [9].

2.1.1. The Definition and Development of ERP. In the early 1990s, Gartner Group Inc., a well-known American computer technology consulting and evaluation team based on the development of computer data processing technology and the needs of enterprise supply chain management at the time, predicted this trend [10, 11]. In the information age, the development of production management information systems and the upcoming changes make it possible for the concept of ERP and the planning of business resources.

ERP is a complete system that can collect all internal resources of the organization and execute effective planning and control to achieve maximum benefits [12]. Its goal is to improve information, logistics, capital flow, value flow, and business flow by using programming and control as a benchmark and using network and information technology as a platform to integrate marketing, sales, and customers and improve customer satisfaction [13]. Functions such as market, planning, production, financing, quality, service, data integration, and business process reengineering (BPR) are combined to solve the concepts and methods of supply chain management (SCM) [14].

It can be divided into three levels: management ideas, software products, and management systems [12].

(1) The standard business management system proposed by Garter Group Inc. is developed based on MRPII (Manufacturing Resource Planning). This is a management concept that supports the supply chain. (2) With integrating
client/server systems, relational database structure, object-oriented technology, graphical user interface, fourth-generation language (4GL), network communication software products, another success in the information industry is based on the idea of ERP management [2, 15]. (3) A business resource management system combines corporate management concepts, business processes, basic information, human resources and materials, computer hardware and software. The internal and external resources of the enterprise organization are managed and optimally configured through the network. The conceptual hierarchy of a new generation of management information system [16] ERP that manages information at the enterprise level can be shown in Figure 1:

The development of ERP has gone through four main development stages [5, 17]:

The first step: MRP (Material Requirements Design) was created in the 1960s and is mainly used for procurement management and inventory control. Its main function is to use BOM, inventory information, and main production plan to calculate material requirements.

The second stage: Closed-loop MRP was created based on MRP in the 1970s. It combines original capacity planning, capacity demand planning, production, and procurement, creating feedback and creating a closed loop.

The third stage: MRPII.

The fourth stage: ERP (Enterprise Resource Planning) was born in the early 1990s. On the basis of MRPII, functions such as distribution management, human resource management, logistics management, quality management, and decision support systems were added. Everything is an extension from supplier to customer. ERP uses advanced information technology, such as network technology, Internet, graphical interface, fourth-generation computer language, relational database, distributed database processing, and open client/server system. As a result, the integration capabilities are enhanced and the organization’s global operations can be supported.

2.1.2. Superiority of ERP System. ERP system will bring direct and indirect benefits to enterprises; the following are its advantages [18, 19]:

(1) Business integration: At this time, it is the most advantageous point of all the advantages, because the ERP system can realize the promotion of group business.

(2) It is highly adaptable: This is the second important advantage of the ERP system. The ERP system can handle different currencies and accounting standards as a whole and at the same time carry out the execution of different functions and assign them to different departments for implementation. This adaptability is the basic prerequisite for adapting to the general trend of the organization and maintaining the unity of the system.

(3) Better analysis and planning capabilities: ERP systems can make full use of various decision support systems and decision simulation functions to comprehensively use relevant business data in real time, so that decision makers have strong support, can ensure the correctness of decisions, and make decisions. The correct strategy leads the development of the enterprise.

(4) Ability to apply the latest and most advanced technology: In order to benefit from the new development of technology, ERP suppliers must quickly adjust their ERP systems, because ERP systems can adapt to today’s fast-developing technology and gain in the information age. Operation enables companies to better adapt to the ever-changing business environment.

2.2. B/S Architecture and C/S Architecture. My country’s software development industry has gone from the initial workshop slash-and-burn development to the current iterative development method of prototypes using advanced UML development concepts. During this period, many detours have been taken and many advanced concepts have been introduced from abroad [20]. After getting rid of the initial low-efficiency standalone operation mode, software development has gradually developed toward network interconnection. From local area networks to metropolitan area networks to the Internet, the impact of software on our lives and the promotion of productivity have become more and more significant. Among them, the more representative software developed with C/S architecture model are QQ, Fox-mail, antivirus software, input method, mobile phone APP, etc., while the application system built using B/S architecture includes e-mail system, personnel management system, CMS system, etc. [21, 22].

2.2.1. The Difference between B/S and C/S Architecture

(1) Difference in hardware environment:

The C/S architecture uses special software to be placed on the client side and the server side. The
operation of the special software takes up a lot of server resources and requires more server hardware [23]. Its professional application software requires no small server data occupancy space, server memory resources, and controller clock resources. The B/S architecture uses the browser-side software and Web-logic middleware software that most people have and uses the HTTP network interworking protocol, which has less restrictions on hardware and is suitable for large-scale crowd use [24].

(2) Difference in safety requirements:
The C/S architecture is mainly used in small-scale enterprises and institutions with high security requirements. It has relatively high security requirements for data transmission security, terminal access server authentication, and user-side filling-in information security. The B/S architecture is mainly oriented to a wider range of user groups. Although encrypted transmission can be carried out through HTTPS protocol and other methods, it has lower requirements for security and higher requirements for user experience and ease of use [25].

(3) Difference in system operation and maintenance:
The C/S architecture is more complicated for the system operation and maintenance level. Since its architecture is inseparable as a whole, it is necessary to update the other end correspondingly to achieve the interconnection of data transmission on both sides when upgrading and updating on the server side or the client side. The system operation and maintenance work of this information system architecture is relatively complicated, and the system operation and maintenance cost will be relatively higher. The coupling of the B/S architecture is very loose. The server end is upgraded and the client end does not need to be upgraded. The B end of the B/S architecture can use the user’s browser to compete, and the B end of the B/S architecture can be in multiple. The system uses a browser to access, the operation and maintenance cost of this architecture is not high, and the operation and maintenance will be enhanced day by day [26].

(4) Differences in interface modes:
The access mode of the C/S architecture is based on the Internet protocol suite, and some special application business requirements are built on the network layer or data link layer. The application system server will select the most suitable development language protocol according to a variety of situations, and the meaning of each byte of data is clearly regulated. The interface protocol of the B/S architecture basically uses the HTTP protocol, and the interface method uses the Web-Service interface. The specifications of its data packets have been clearly stipulated by the international ISO organization, and the relevant protocols need to be identified during the research and development process.

(5) Differences in database connection methods:
The client side of the C/S architecture requires relatively short data flow display and storage time. The communication between the client side and the server side is very frequent, so the C/S architecture server and the client are always connected. As long as there is a data request demand, it can be responded to immediately, although this will consume a lot of database resources, but because the architecture generally has a relatively small number of terminals and high real-time performance of the business, most of them adopt this method. For example, a typical case of C/S architecture often linking is the banking system business.

2.2.2. Advantages of B/S and C/S Architecture.
Advantages of B/S architecture: (1) Wide range of applications: OS systems with browsers such as Chrome and Firefox can access the server-side application part according to established specifications, and the server-side application part can also provide on-demand services anytime, anywhere. (2) Low operation and maintenance costs: The architecture server-side maintenance or function update client does not need to cooperate, so that what you see is what you get is synchronized. (3) Low R&D cost and high efficiency: The TCP/IP protocol suite of the Internet contains many subprotocols, and the use of these protocols is the basic of B/S architecture communication [27].

Advantages of C/S architecture: (1) There is fast response speed. (2) Strong transaction processing capabilities: Application system development with targeted and dedicated personnel is the main advantage of the C/S architecture, which can be customized very personally for users. (3) The interface is highly friendly and can meet the unique needs of users. The client software is developed completely according to user needs. (4) High security: For client-side management and control, the client side can be accompanied by a security scanning function, and a dedicated transmission protocol is used in the transmission process. The transmission protocol can use either an internationally accepted encryption protocol or an encryption method set by yourself to ensure the security of the transmitted data. Since the server side of the C/S architecture is developed by enterprises and institutions, information leakage caused by backdoors of foreign service software can be basically eliminated. (5) High data scalability: Most of the C/S architecture systems use large databases such as Oracle and DB2. This kind of database has strong data scalability in terms of subdatabase, query, and analysis of massive data. (6) Massive computing power: Most of the work that consumes server-side system resources, such as data calculation and information processing, can be placed on the client side [28].
2.3. Multiple Linear Regression

2.3.1. General Form. Multiple regression analysis is one of the methods to quantitatively predict the development and change of things based on social economic phenomena. Quantitatively analyze the reasons for growth and the motivation of things, obtain the quantitative relationship between the variables of things, and then predict their growth and motivation [29]. Suppose that the predicted object is \( w \) and the factor that affects the predicted object is \( x_i \), where \( i = 1, 2, 3, \ldots \) is the number of influencing factors. \( x_i \) are independent of each other, and you should not choose too many factors that affect \( w \); otherwise there will be problems such as multilinearity and heteroscedasticity, which will affect the accuracy of the prediction results. In order to avoid the collinearity problem in the prediction process in advance, the correlation coefficient \( L \) can be used to detect the correlation of the independence.

\[
L = \frac{\sum_{i,j=1}^{n}(x_i - \bar{x})(x_j - \bar{x})}{\sqrt{\sum_{i=1}^{n}(x_i - \bar{x})^2 \sum_{j=1}^{n}(x_j - \bar{x})^2}}
\]  

Among them, \( x_i \) is the selected predicted object, the average value is \( \bar{x} = \sum x_i / n \), and the general correlation coefficient \( L < 0.3 \) considers that there is no correlation between the predictors; that is, the predictors are independent of each other.

After the correct selection of influencing factors, we assume that there is a linear correlation between the predictor and the predicted object; that is, \( w = f(x_1, x_2, x_3, \ldots, x_k) \) is a linear function, and the multiple regression model is established as

\[
w_i = \beta_0 + \beta_1 x_{i1} + \beta_2 x_{i2} + \cdots + \beta_k x_{ik} + \varepsilon_i.
\]  

Among them, \( \beta_1, \beta_2, \ldots, \beta_k \) is called regression coefficient, \( \beta_0 \) is a constant term, both can be called regression parameters, and \( \varepsilon_i \) is residual error. The regression coefficient reflects the degree of influence on the predicted object when the predictive factor \( x_1, x_2, x_3, \ldots, x_k \) changes.

When given \( n \) observations of \((w, x_1, x_2, x_3, \ldots, x_k)\), a multiple linear regression prediction model is obtained:

\[
\hat{w}_i = \hat{\beta}_0 + \hat{\beta}_1 x_{i1} + \hat{\beta}_2 x_{i2} + \cdots + \hat{\beta}_k x_{ik} + \hat{\varepsilon}_i.
\]  

Among them, \( x_{i1}, x_{i2}, \ldots, x_{ik} \) is the \( i \) observation value, \( \hat{\beta}_0, \hat{\beta}_1, \hat{\beta}_2, \ldots, \hat{\beta}_k \) is the regression estimation parameter, and \( \hat{\varepsilon}_i \) is the \( i \) observation residual item, denoted as follows:

\[
X = \begin{bmatrix}
1 & x_{11} & \cdots & x_{1k} \\
1 & x_{21} & \cdots & x_{2k} \\
\vdots & \vdots & \ddots & \vdots \\
1 & x_{n1} & \cdots & x_{nk}
\end{bmatrix},
\]

\[
\hat{\beta} = \begin{bmatrix}
\hat{\beta}_0 \\
\hat{\beta}_1 \\
\vdots \\
\hat{\beta}_k
\end{bmatrix},
\]

\[
\varepsilon = \begin{bmatrix}
\varepsilon_1 \\
\varepsilon_2 \\
\vdots \\
\varepsilon_n
\end{bmatrix},
\]

Then the multiple linear regression model can be written in matrix form:

\[
W = X\hat{\beta} + \varepsilon.
\]  

2.3.2. Least Squares Estimation Method. The least squares estimation takes the minimum sum of squared errors as the condition of the accuracy of the linear regression model; that is, for a given linear regression model \( W = X\hat{\beta} + \varepsilon \), the variance \( \sigma^2 \) of the random error \( \varepsilon \) is the smallest; that is, the influencing factors other than the considered predictive factor are minimal, recorded as

\[
\hat{\varepsilon} = W - X\hat{\beta}.
\]  

It is the residual vector of the prediction model; then the residual sum of squares is

\[
S_E^2 = \sum_{i=1}^{n} \hat{\varepsilon}_i^2,
\]

and then

\[
S_E^2 = \hat{\varepsilon}^T \hat{\varepsilon} = (W - X\hat{\beta})^T (W - X\hat{\beta}) = W^TW - \hat{\beta}^T X^TW - W^TX\hat{\beta} + \hat{\beta}^T X^T \hat{\beta},
\]

and among them,

\[
\hat{\beta}^T X^TW = (\hat{\beta}^T X^TW)^T = W^TX\hat{\beta}.
\]

Regarding the residual \( \hat{\varepsilon} \) as a function of \( \hat{\beta} \), due to the nonnegativity of the residual, it can be seen that there is \( \hat{\beta} \), so that \( \partial \hat{\varepsilon}^T \hat{\varepsilon}/\partial \hat{\beta} = 0 \); then there is

\[
\frac{\partial \hat{\varepsilon}^T \hat{\varepsilon}}{\partial \hat{\beta}} = -2X^T\hat{\beta} + 2X^T \hat{\beta},
\]

Let \( F > F_a(k, n - k - 1) \), available

\[
X^T \hat{\beta}^T = X^T W.
\]

From the assumption of the rank of the matrix X, it can be seen that \( X'X \) is invertible; that is, there is \( (X'X)^{-1} \), and then:

\[
\hat{\beta} = (X'X)^{-1}X'W,
\]

\( \hat{\beta} \) is the least square estimate of parameter \( \beta \), and it is easy to prove that \( \hat{\beta} \) is an unbiased estimate of \( \beta \).

2.3.3. Coefficient Test of Regression Model. The significance of the regression model coefficient \( \hat{\beta} \) is verified by the test of the statistic \( d \), and the statistic \( d = b_j / S(b_j) \) is tested. Among them,

\[
S(b_j) = \sqrt{a_{jj}} S.
\]

It is the sample standard deviation, \( a_{jj} \) is \((X'X)^{-1}\), and the main diagonal element, \( S \), is the standard error:
3. The Research Experiment of ERP System in the Logistics Information Management System of Supply Chain Enterprises

3.1. System Architecture of System Implementation. The system mainly solves the following problems: the process of information transmission is not smooth, the efficiency of the delivery process is too low, the ability to integrate resources is weak, and the efficiency and service level cannot meet the general standards required by the enterprise.

In view of the development requirements of logistics informatization and the development trend in the transportation management process, advanced logistics information technology must integrate advanced logistics management concepts, and the combination of practice and theory promotes the smooth completion of research and development. Aiming at the system architecture, the logistics company transportation management system is a platform with great advantages. It is oriented to multiparty logistics transportation and belongs to the multidimensional logistics transportation business at the management business level. The system needs to face different enterprise customers in specific operations and meet the different needs of customers, which requires the system to achieve complex functions in business. Therefore, the logistics and transportation information management system must realize the multidimensional architecture of the system, so the system is divided into a multilayer structure, and each level has an interactive relationship. The development and design of this system mainly adopt the B/S structure. The specific structure is shown in Figure 2.

System layer: It provides software support for users’ normal operating system, including the system platform installed by the user, the database system installed by the user, and the corresponding software, which are the basics of the system. Service layer: It is the part that is built on the application basic platform and provides services for the system. The application basic platform integrates the development of the logistics transportation system, the integration of various applications, and the foundation of e-commerce. The platform provides corresponding services for the system, helping the system to exchange data at the bottom, relying on the system layer to share data, exchange data with different applications, and provide system log services, catalog management, development frameworks, user permissions, etc. It provides an excuse for daily work and general applications, and it is a portal for external systems to access the system. The service layer also provides the encapsulation of some general classes, as well as the service classes commonly used in the system, providing transaction control, data query, security control, system management, and other aspects of interacting data with the bottom layer of the data. The business logic layer is mainly for handling various logistics-related business processes. The business logic layer performs data operations by calling each package class of the service layer. The presentation layer is the layer where the user touches the system and displays the corresponding system functions most intuitively to the user.

3.2. Physical Architecture of the System. According to the description of the architecture, the realization of the physical architecture of the system is divided into three layers based on the B/S structure, which are the view layer, the business layer, and the data layer in turn.

The workflow of the logistics system is as follows: First, the user may have multiple browsers. When the user’s browser sends a request to the middleware, the system judges whether the user has the authority to perform the corresponding operation according to the current user’s login information session. If it meets the requirements, the web application server will process the browser-side request, find the corresponding processing method, start the data layer service, process the data, and return the processed data and results to the web server container, and the web server container returns to the web server container. Request support for concurrent operations. From the above operations, the network topology of the logistics system is shown in Figure 3.

ERP-based enterprise logistics systems have certain characteristics, such as consistency and convenience of projects, unification and sharing, decision-making flexibility, unification of advanced simulation and forecasting, capital flow and information flow, etc. These functions indicate business logistics based on ERP. The information system is a complete pillar logistics management system. Realize the overall benefits of production and logistics services in effective management, and enhance the company’s overall competitiveness. Several experienced consultants talked about their experience in implementing IT logistics systems for ERP-based companies and said that, to successfully implement an ERP system, three points depend on technology, seven points on talents, and twelve points on data. Although this statement is a bit exaggerated, computers can only function if the information is correct, complete, and timely; otherwise they will produce wrong results. In other words, the product database is the basis for the operation of enterprise logistics IT systems with ERP capabilities. The application scope and depth of the ERP-based business logistics system depend on the company’s needs, coverage, and information content. Therefore, it is very important to prepare and maintain a product database.

3.3. System Detailed Design

3.3.1. Code Design. There are the following principles in code design: (1) The design code must be optimized to meet the needs of users. When designing the code, pay attention to whether the loop condition is an infinite loop. When

\[ S = \sqrt{\frac{1}{n-k-1} \sum_{i=1}^{n} (w_i - \bar{w})^2}. \]
updating the database, you must close the connection and close the read and write stream when reading and writing files. (2) A class represents a method, trying to put some common methods and common constants into the common class. (3) When designing the code, write enough comments so that the maintenance personnel can directly understand the specific meaning of the written code and quickly locate the code that needs to be modified. (4) The writing of the code must conform to standardization. If it is a constant, it must be static. If the parameter passed by the method it is a static parameter.

3.3.2. Database Design. Database design refers to the process of establishing a database that meets business needs after the system implementer has selected specific database software. When designing a database, three stages are required: conceptual design, logical design, and physical design.

(1) Database conceptual structure design

The database conceptual structure design is a conceptual model designed according to the needs of the enterprise. It is an abstract expression of a concrete
relationship. It embodies the connection between virtual life and reality, and it does not require hardware and software environmental support.

(2) Database logical structure design

Logical structure design is to convert the conceptual model completed in the conceptual structure design stage into a data model that can be supported by the selected database management system (DBMS).

4. Experimental Results and Analysis

4.1. Database Design Analysis. The conceptual design of the database is only a simple description of the system database design, and it does not describe the system data requirements in detail. In the logistics information management system, the database uses SQL Server 2008, and the physical model of the system’s database is shown below. The function information of this system is embodied in a tree structure, and the subordinate relationship is established in the database mainly through function codes and superior function codes.

4.1.1. System Module. The structure of the system function table is shown in Table 1.

<table>
<thead>
<tr>
<th>Serial number</th>
<th>Field name</th>
<th>Types</th>
<th>Constraint</th>
<th>Field description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ID</td>
<td>int</td>
<td>Primary key, automatic growth</td>
<td>Serial number</td>
</tr>
<tr>
<td>2</td>
<td>GNDM</td>
<td>Varchar</td>
<td>Cannot be empty</td>
<td>Function code</td>
</tr>
<tr>
<td>3</td>
<td>URL</td>
<td>integer</td>
<td>Cannot be empty</td>
<td>Link address</td>
</tr>
<tr>
<td>4</td>
<td>GNMC</td>
<td>Varchar</td>
<td>Cannot be empty</td>
<td>Function name</td>
</tr>
<tr>
<td>5</td>
<td>GNMS</td>
<td>Varchar</td>
<td>Can be empty</td>
<td>Function description</td>
</tr>
<tr>
<td>6</td>
<td>DKKWZ</td>
<td>Varchar</td>
<td>Can be empty</td>
<td>Open position</td>
</tr>
<tr>
<td>7</td>
<td>IMGURL</td>
<td>Varchar</td>
<td>Can be empty</td>
<td>The map’s address</td>
</tr>
<tr>
<td>8</td>
<td>LEVEL</td>
<td>int</td>
<td>Cannot be empty</td>
<td>Node level</td>
</tr>
<tr>
<td>9</td>
<td>SJDM</td>
<td>Varchar</td>
<td>Cannot be empty</td>
<td>Superior code</td>
</tr>
<tr>
<td>10</td>
<td>XSSX</td>
<td>int</td>
<td>Cannot be empty</td>
<td>Display order</td>
</tr>
</tbody>
</table>

The field length of each field name of the user module is shown in Figure 5:

4.2. Summary Analysis of Order Information. The order information summary is used to record the information of each commodity warehousing, including the warehousing order number, handler, warehouse, supplier, etc. The length of each field name in the order table structure is shown in Figure 6.

4.3. Realization of Main Functional Modules

4.3.1. Login Interface. In this interface, users can log in to the system. The user can enter the main page of the logistics management system through the login interface. If the username or password is incorrect, the system will automatically jump to the login interface.

4.3.2. Order Query Interface. In this interface, the user can query the specific information of the logistics order according to the query conditions, and the warehouse administrator can check the corresponding data.
4.3.3. Warehouse Information Query. The warehouse manager can query the specific information of the warehouse, including location, warehouse code, contact person, etc.

4.3.4. Order Management Interface. Order administrators can manage orders and make order summaries according to the delivery requirements of users.

4.3.5. Warehouse Information Interface. Users can view and modify the information of each warehouse.

5. Conclusions

This paper proposes that the development of an ERP-based enterprise logistics information system is not a pure logistics information system. The idea is to integrate the logistics function modules of ERP on the basis of ERP and add appropriate other modules. After analyzing the current ERP system and based on the logistics system, an enterprise logistics information system based on ERP is designed in detail.
The research value of this article is reflected in the following:

(1) Integrated ERP logistics module improves the response speed and accuracy of the system.

(2) Fully consider adopting modern cost control methods to manage the smooth progress of development projects and ensure the financial guarantee for system development.

(3) The designed system not only meets the needs of large-scale enterprises, but also suits the needs of small and medium-sized enterprises. The system has a certain degree of versatility.

(4) Modularization and flexibility are adopted when designing the system. Different companies can customize corresponding modules according to their own needs, so as to meet the application requirements that are in line with actual business needs, and achieve the greatest cost-effectiveness and efficiency.

(5) The information sharing between the system and other ERP systems is fully considered. Information sharing is the most difficult and most valuable aspect of designing a system.

Data Availability

No data were used to support this study.

Conflicts of Interest

All authors declare that they have no conflicts of interest.

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References


