

Research Article

Research and Development of Inventory Management and Human Resource Management in ERP

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Nowadays, more and more companies are applying total inventory management as well as human resource management as one of the core concepts of the enterprise management platform. ERP is a resource allocation platform based on information technology applications to have the advantage of advanced and comprehensive management ideas to provide planning and operation software for enterprise managers and employees. This paper describes in detail the ERP system, as well as its planning and control ideas, its ideas, and the idea of internal control of enterprises in line with the rapid development of the information economy and knowledge economy in today's situation; ERP systems also have some inefficiencies and other situations; in response to this situation, this paper also analyzes the ERP system by analyzing the application of ERP systems in enterprises, from the market function information system and ERP system in the application to inventory management as well as to human resource management for decision-making, exploring its deficiencies in the inventory management system and human resource system and then proposing corresponding improvement methods and corresponding development measures. Enterprises can use the improved advanced information technology to enhance the unity and sharing of data and fine management and improve operational efficiency, and enterprises can achieve standardized and process-oriented management of daily operations by using the improved ERP to control various business processes such as production, procurement, and sales and realize the collaborative processing of financial and business processes.

1. Introduction

Global economic integration is a major trend in international economic development which in recent years has brought rare opportunities and serious challenges to enterprises. To win in the competition, enterprises have to improve their shortcomings in a lot of ways. The price of product enterprises was reduced on the one hand through a variety of effective management tools and technology to cut costs and on the other hand through the aspect of using effective enterprise information management tools [1]. In China, with the development of the market economy are modern enterprises. The ERP system is the most advanced enterprise management technology and method that emerged in foreign countries at the beginning of the century

and can bring great benefits to enterprises. In this paper, inventory management in the system is the object of study. In the framework of the supply chain, inventory management is the most critical link in the special management of manufacturing enterprises; it is no longer limited to simple material resource allocation and management, which puts forward higher requirements for inventory management. With the advent of the information age, the ERP system has become the mainstream means to improve the management level of a lot of enterprises and has been widely used in supply chain inventory management [2]. In the ERP environment, modern network technology and computer platform are used to build an information system to achieve efficient management of supply chain inventory, although it can collaborate with all aspects of the procurement,

production, and sales system; at the same time, it also faces new problems, highlighted in inventory control, which affects the effectiveness of the implementation of the whole ERP system, so the study of supply chain inventory management in the ERP environment has become a new subject. However, with the continuous development of economic globalization and the increasingly fierce market competition, especially the impact of the financial crisis, the OEM enterprises at the end of the industrial value chain are facing a serious situation due to the backlog of inventory and poor circulation of production materials. In the marketing category, inventory can be said to be an important part of enterprise logistics; the potential for inventory cost reduction is much greater than other marketing links, because logistics costs cover almost half of the enterprise marketing costs and about 30% of the total value of the product, while inventory costs account for 35%.

The ERP system is the abbreviation of Enterprise Resource Planning. It is based on information technology and integrates information technology and advanced management ideas. With systematic management ideas, it provides decision-making methods for enterprise employees and decision-makers. For the management platform, it is a new generation of integrated management information systems developed from MRP (Material Requirement Planning). It extends the functions of MRP, and its core idea is supply chain management. It goes beyond the boundaries of traditional enterprises, optimizes the resources of enterprises from the scope of the supply chain, optimizes the operation mode of modern enterprises, and reflects the market's requirements for enterprises to rationally allocate resources. It has a significant effect on improving the business process of the enterprise and enhancing the core competitiveness of the enterprise.

It can be said that the traditional inventory management model has been unable to adapt to the requirements of inventory management in the information age due to the lack of a supply chain concept [3]. With the help of the enterprise management information system (ERP), the information of inventory management and control is an effective way to solve the traditional inventory management problems. For this reason, more and more companies are buying various information software to improve their information, and ERP software is favored by these companies as software that provides a systematic solution. However, with the construction and application of ERP, the supply chain inventory management presents new changes and characteristics and also faces problems such as the poor operation of inventory management and control modules. If enterprises still manage inventory according to the existing inventory control model, there will undoubtedly be a mismatch with the ERP system, which will lead to the effectiveness of inventory management and control. Therefore, this thesis is aimed at analyzing the problems and causes of inventory management and human resource management in the ERP environment, to optimize the inventory management and control in the ERP environment and to propose specific solutions and corresponding development measures, to enable enterprises to achieve reasonable control of inventory and improve market competitiveness.

2. Relevant Works

Since 2000, the country puts forward the "artificial intelligence technology [4–6] to drive industrialization" of the new industrialization road, China's enterprise information construction pace has accelerated significantly setting off the application of the system climax, a lot of domestic enterprises are actively implementing the system now and thousands of enterprises use ERP systems, and ERP applications are also expanding, for example, human resource management [7]. In today's market environment, enterprises rely only on strong production capacity, and excellent products are far from enough. To survive and grow, enterprises must reduce various costs and increase profitability. Informationization of enterprise management has become a necessary condition for operators to make full use of information resources, grasp market opportunities, and better organize human, material, and financial resources for production and operation activities. Research on inventory management can be traced back to the 1930s and emerged in the 1980s in Western countries. The research on inventory management in China started in the 1990s, and due to the rapid development of China's economy, a hundred schools of thought have emerged in this area in the 21st century. This paper will collect the research literature on safety stock, ABC classification, sales forecasting, inventory management, and CMI from domestic and foreign experts and scholars [8].

The literature focuses on the safety stock setting of general-purpose materials, analyzes the factors affecting the safety stock quantity, and concludes that the procurement lead time is the main factor affecting the safety stock quantity, and the enterprise can optimize the procurement chain to reduce the procurement lead time, accelerate the material turnover speed, and finally achieve the purpose of reducing the safety stock. The literature focused on the safety stock setting of general-purpose materials, analyzed and studied the factors affecting the safety stock quantity, and concluded that the procurement lead time is the main factor affecting the safety stock quantity, and the enterprise can optimize the procurement chain to reduce the procurement lead time and accelerate the material turnover speed and finally achieve the purpose of reducing the safety stock. The literature studied how to set safety stock based on material requirement planning management. The premise of their study is how to carry out the most effective material requirement planning exercise in a given business environment to set a minimum safety stock level while ensuring production. They listed the factors that affect the setting of safety stock levels to form a mesh model and then analyzed each factor individually to determine the extent to which it affects whether the final order is delivered on time. It was eventually concluded that the relevant factors involved in safety stock affect each other but do not directly influence the final delivery outcome. The literature is based on the now popular supply chain management model for safety stock research as well as the ERP system to this classification of products and then the supply chain management strategy and safety stock management strategy for these categories of products, respectively, through a large amount of data; to come up

with different categories of products should be how to ensure the effective operation of the supply chain method under the limited amount of safety stock, so that the enterprise thus reduce inventory and achieve the purpose of reducing production costs [9].

Literature is combined with the practical situation of operation, using a qualitative forecasting method, based on the current market demand situation of the company; sales staff and customers were asked and surveyed, and then, statistical analysis was conducted based on the results of the survey, and finally, the demand forecast data was derived. Eventually, the actual order situation in the market confirms the validity of its demand forecast and provides a more reliable basis for the company's marketing decisions. The literature tried to attempt a quantitative analysis of demand forecasting with the help of a fuzzy linear regression function tool for demand forecasting. In the research process, they added qualitative demand forecasting analysis and achieved good results after combining qualitative and quantitative analyses for demand forecasting, thus verifying the feasibility of using a combination of qualitative and quantitative forecasting and providing valuable research ideas for subsequent researchers [10]. The literature used the GM(1, 1) grey model to analyze and forecast the future revenue trend of direct selling companies and predicted that the revenue of direct selling companies will rebound in the next quarter, using Amway, a US direct selling company, as a research sample. The main objective of the paper, which is specifically focused on inventory management in the medical device industry, is to verify which model is most effective in controlling inventory to achieve optimal cost and speed in the inventory control process. He conducted a pilot study using the inventory management model, the JIT model, and the zero inventory management model, respectively. In the end, the benefits of the inventory management model were significantly higher than those of the other two models in their particular circumstances [11].

The literature studies inventory in multilevel supply chains. They point out that in today's world of market activities, the division of labor is getting more and more detailed so that the supply chain lines are getting longer and longer, making their supply chain control quite difficult for companies under of the chain. If each point in the chain has its inventory management, it is quite passive at the end of the chain, while the distortion of data at each point is magnified and the risk of inefficient operation is increasing. If each point in the supply chain adopts an inventory management model, the efficiency of the whole supply chain will be improved exponentially, and the inventory of each point in the supply chain will be significantly reduced. Using the multiplier principle, it is clear that the more levels of the supply chain, the more significant the relative effect of the inventory management model [12].

3. ERP System Inventory Management and Human Resource Management

3.1. ERP System Operation Model. Enterprise Resource Planning (ERP) is an information system, so the standard name

should be ERP. ERP takes information technology as the carrier and stores the data through the database, and the user operates through the front-end interface, injecting the enterprise management idea into it. The core of the ERP system is the management culture of the enterprise, through the input of data, computing, and then output data to provide decision-making tools for employees at all levels of the enterprise and the decision-making level [13].

For requirement planning, the core of MRP is object-centric; its focus is on material requirement planning, such as Figure 1. It is the ERP system framework hierarchy diagram. After the optimization of this system, the supplier's inventory management and human resource management can be well optimized, to achieve better utilization of the entire resources.

With the continuous development of enterprises and the introduction of supply chain ideas, the ERP system was born. The ERP system is based on the MRP system and constantly expands its functional modules and the management of enterprise ideas into each management module. From the user's point of view, the ERP system is divided into a data entry module, process approval module, and report module. The refinement of enterprise management, customer relationship management system, supply chain management system, personnel attendance system, product life cycle management system, etc., as shown in Figure 2, shows the ERP system optimization of the main module layout.

Safety stock, also known as insurance stock (or minimum stock, as some companies call it), exists because of unexpected events. For example, if a customer suddenly places an order and requires delivery outside the standard supply chain capacity (ignoring the company's production capacity for the moment), the company cannot meet the customer's demand without safety stock levels. It is the uncertainty of external factors (customers may place sudden purchase orders, and suppliers may not have the material available or may not be able to deliver the item on time) that makes safety stock so important. As mentioned earlier, resources are scarce for all businesses. Companies cannot unconditionally stockpile large quantities of raw materials to meet customer demand. Nor is it possible to produce large quantities of finished goods to respond to urgent customer demand. In terms of optimizing efficiency, zero inventory is, of course, the lowest cost state, but in the real business process, affected by the capacity of the supply chain, the production capacity of the enterprise, and the management level of the enterprise, the difficulty of achieving zero inventory is quite huge, and any problem in one of the links will affect the normal operation of the enterprise [14].

All the above reasons lead to the examination of safety stock management. It is relatively easy to calculate safety stock, but it is not easy to set a safety stock that suits the needs of the company. Therefore, every production-oriented company needs to set the right level of safety stock. A high level of safety stock can increase customer satisfaction and improve response time to customer needs, but it leads to the inventory taking up too much of the company's working capital. At the same time, if products are being replaced at a rapid rate, it also tends to cause some

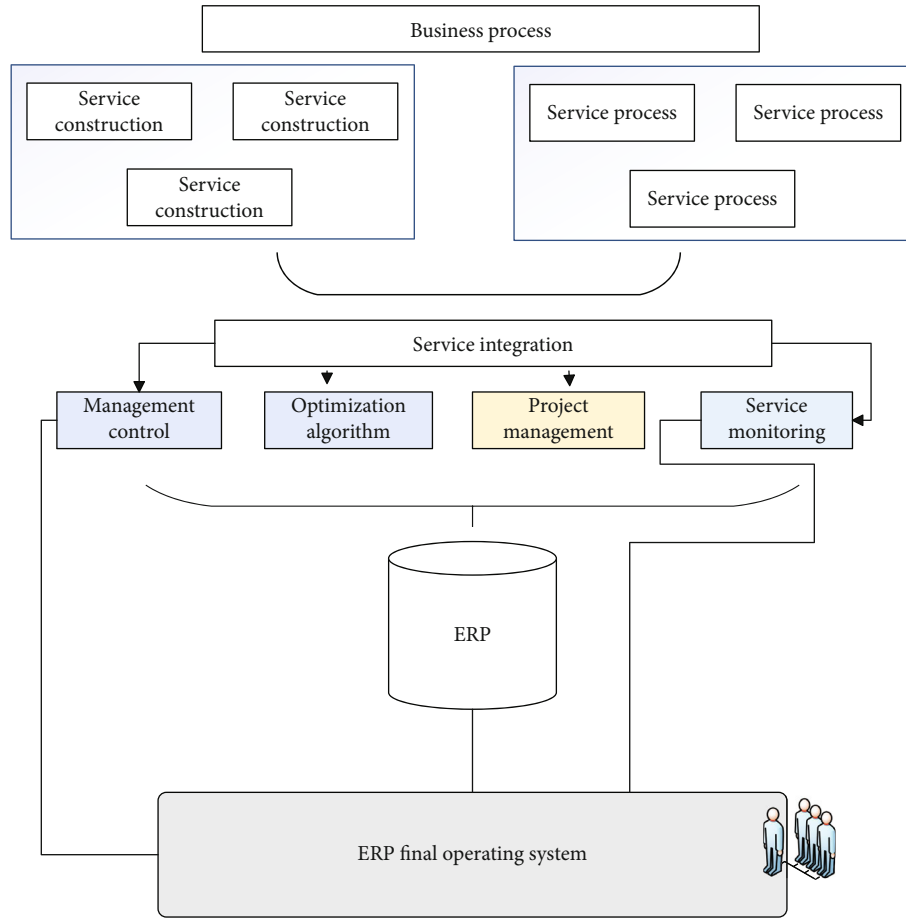


FIGURE 1: ERP system framework hierarchy diagram.

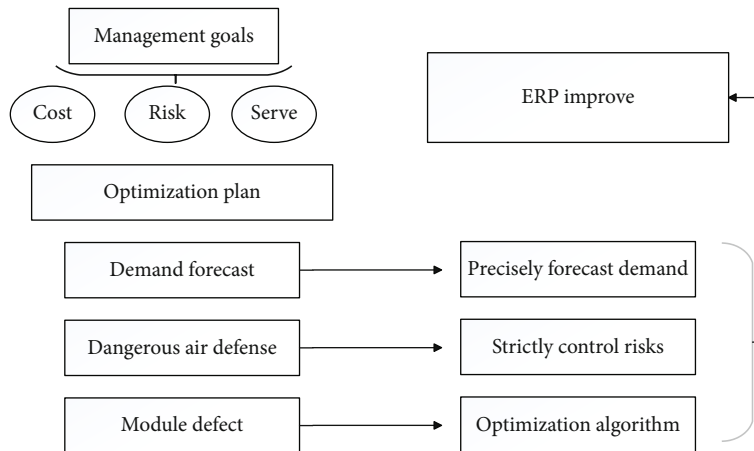


FIGURE 2: ERP system optimization main module layout.

nongeneric materials to become stagnant and may eventually be simply scrapped, leading directly to an unproductive drain on the company’s working capital. On the other hand, if the safety stock is too small, although it can reduce the backlog of the enterprise’s working capital, when there are unexpected events, the enterprise cannot effectively respond and ultimately affects the competitiveness of the enterprise.

Therefore, the right safety stock is a balance between cost and service level, which can meet the customer’s delivery needs in general and also the inventory cost and inventory risk of the enterprise. The right safety stock is different for each company because three factors affect the safety stock setting; they are the procurement lead time of materials, the company’s service level, and the variation of customer

demand; each company has a different focus and supply chain management level, so the final safety stock quantity will also vary.

The SS formula for a safety stock consisting of three elements is

$$S(j) = \frac{1}{n} \sum_{i=1}^n X_i Y_i. \quad (1)$$

3.2. Inventory Management Process in ERP. The implementation of the entire supplier inventory management is transparent, and the buyer's enterprise and the supplier can monitor it at any time. It is mainly divided into two parts: Inventory management: in fact, it is composed of sales forecasting and inventory management as well as the supplier's production system because after the supplier's inventory management is implemented, the work of these parts is mainly completed by the coordination of the supplier and the buyer's enterprise. So, it is classified as a module to deal with: first, the buyer's company obtains the sales data of the product and then combines it with the current inventory level and transmits it to the supplier in time, and then, the supplier's inventory management system makes a decision: if the supplier or the existing warehousing system can meet the number of products required by the inventory management system to make decisions, the warehousing and transportation distribution system will directly deliver the products to the buyer's enterprise promptly. If the supplier's existing warehousing system cannot meet the inventory management system, to make a decision, it is necessary to notify the production system to produce the product and then deliver the product to the buyer's enterprise promptly through the transportation and distribution system. Among them, before the formal order is generated, it should also be handed over to the buyer's enterprise for verification, and the final order can be obtained after adjustment.

Supplier managed inventory is a new inventory management model developed to reduce costs for both sides of the transaction. Inventory management is based on the rapid response and effective customer response management model. The core idea of "sharing" is that both supply and demand sides share their effective inventory data and current and future demand data and then replenish the stock according to the actual purchase or consumption data of the demand side. Due to the sharing of information, the supply and demand sides save unnecessary communication costs and unnecessary guesswork, avoid unnecessary inventory backlogs, and thus reduce the total cost of the entire supply chain. Under the traditional inventory management model, each enterprise in the supply chain is working on its own, playing the internal calculations of the enterprise, and not managing inventory from an integrated and holistic view. The emergence of inventory management breaks the old model of inventory management, in which both supply and demand sides place objects in the physical area of the demand side or a third party based on a common agreement, and the supply side manages the inventory. The agreement is optimized and adjusted based on the experience of both parties so that the

supply and demand sides can continue to work together better. From the point of view of property rights, although the supplying party's items are delivered to the area designated by the demander, the property rights still belong to the supplying party and there is no liability on the demander's side, but the demander needs to take certain responsibility for the storage of the items. Only when the demander takes possession of the items in the inventory management warehouse do the property rights and claims change. Figure 3 shows the flow chart of the production and inventory business of the company based on the ERP system [15].

The implementation of an inventory management model is beneficial to both the supply and demand sides. For the supply side, inventory management can stabilize customer relationships while reducing transportation costs and improving delivery efficiency; for the demand side, it not only reduces the pressure of inventory on working capital but also reduces the risk of material shortages and speeds up the supply chain response. With the widespread use of inventory management, the initial weakness of the supply side is gradually reversed and the related inventory management agreements are gradually improved. For inventory management, the setting and management of inventory levels are also more scientific, as the maximum and minimum values of inventory are set based on past transaction data and future demand forecasts of both parties to determine specific inventory targets. The inventory management model has been applied by domestic and foreign enterprises for more than 20 years, especially in large enterprises such as Wal-Mart, P&G, Amazon, Foxconn, and Heller. The inventory management model has been proved to be an effective and advanced inventory management model with a lot of advantages, which can be summarized as follows: (1) During the agreement cycle, there is no transfer of property rights and no claims occur. Therefore, the demand side does not experience the situation of inventory crowding out the operating capital of the enterprise, which can reduce its operating costs for the demand side and directly enhance its market competitiveness. (2) The sharing of information between the supply and demand sides helps to reduce the communication cost and improve the communication efficiency of both sides and also reduces the "bullwhip effect" in the demand forecast between the supply and demand sides. (3) Due to the zero response time of object supply, the productivity of the demand side can be improved, thus improving its customer response time and customer satisfaction. (4) It helps the supplier to stabilize its customer relationship and increase its customer stickiness. The inventory management model has a lot of advantages but also has a lot of limitations, which can be summarized in the following aspects. (1) Since the core of the inventory management model is information sharing, it is highly dependent on the information technology of the enterprise. (2) In the inventory management model, the demand side is obviously in a dominant position, and if the underwriting terms are not agreed upon through coordination, the cooperation between the two parties is still a "zero-sum" game. (3) The inventory management model requires a certain level of financial and managerial strength on the part of the supplier. In the absence of an

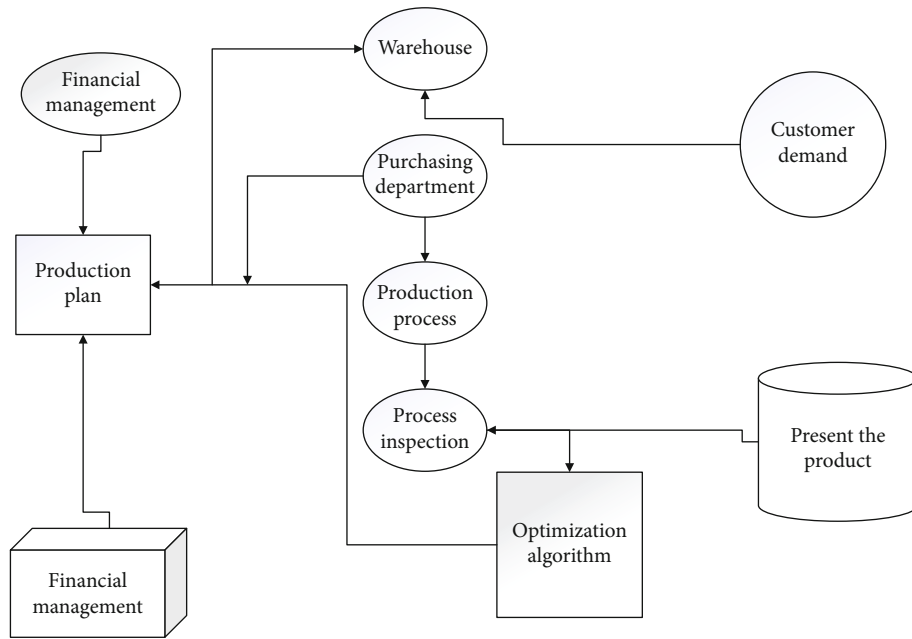


FIGURE 3: Flow chart of the company's production and inventory business based on ERP system.

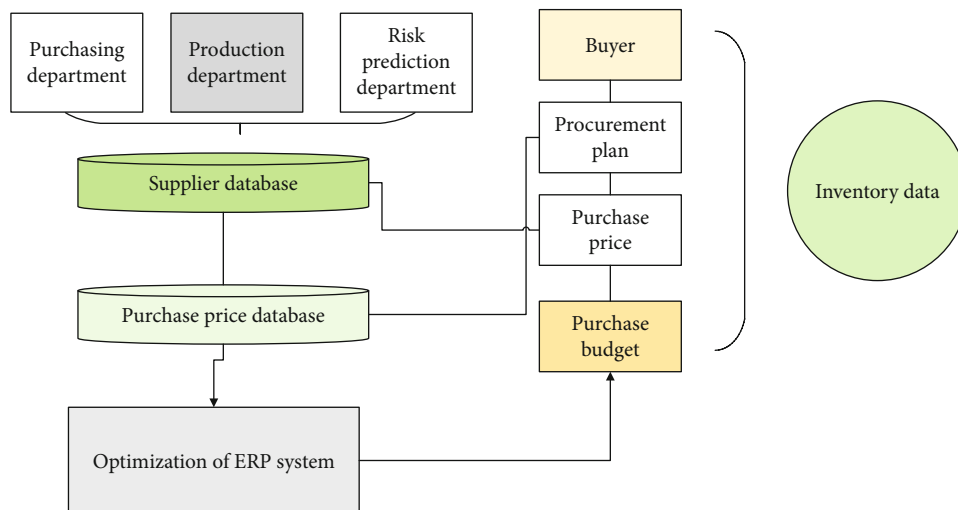


FIGURE 4: Flow chart of the company's ERP-based procurement and payment process.

equal underwriting agreement [16], the supplying party is exposed to the risk of inventory build-up. Figure 4 shows the procurement and payment process of the ERP system.

3.3. *Human Resource Management Strategies in ERP.* The job description is an important international tool for the company's human resource development and management. It has a fundamental role in improving work performance, performance evaluation, job training, standardizing management processes, and goal management. A considerable proportion of companies in our country are not accustomed to using job descriptions for human resource development and management, which is extremely detrimental to the company's development. It is expected that more and more companies will introduce and use "job descriptions" to optimize

the allocation of human resources and improve the level of human resource management.

In today's increasingly fierce business competition between enterprises, how to attract the best talent, rationalize human resources, reduce personnel costs, and improve the competitiveness of enterprises have been the primary consideration of enterprise managers; that is, to consider the addition of ERP in the human resources system has made its functions expanded to a full range of enterprise management. The scope of HR functions has also developed from a single payroll accounting and personnel management to a full range of solutions that can help the enterprise's decision-making. These areas include human resource planning, employee evaluation, workforce scheduling, time management, recruitment management, employee payroll,

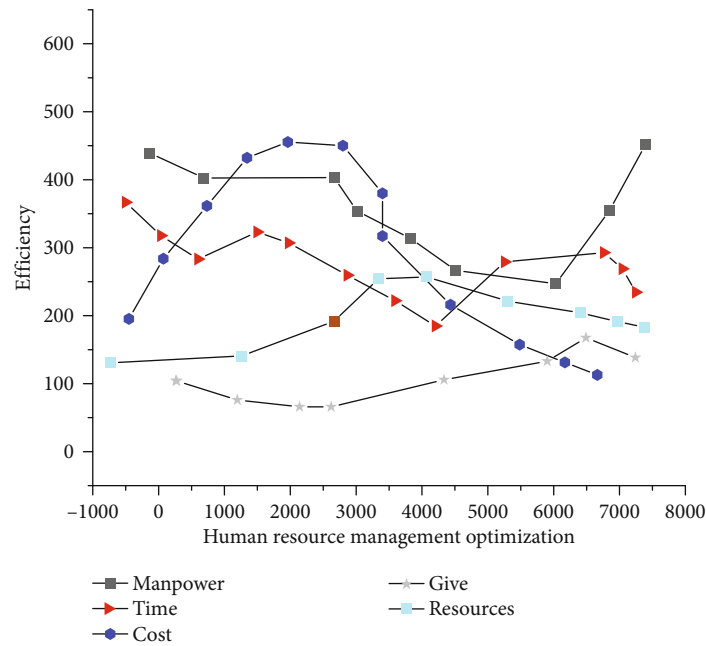


FIGURE 5: Efficiency of traditional HRM in ERP.

training programs, and travel management. Together with the financial and production systems in ERP, they form an efficient and highly integrated enterprise resource system. Figure 5 shows the efficiency of the traditional HR management compared with the optimized one [17].

The HR system is used to support decision-making in human resources planning. Managers can use the HR system in ERP to easily develop their own organizational and staffing planning plans based on their production needs. The comparison of various plans in the system and the evaluation of simulated operations generate result data for various plans and provide support for managers' final decisions through an intuitive graphical user interface. Human resource planning also allows the development of job models including job requirements, promotion paths and training plans, and a series of training recommendations for the employee based on the qualifications and conditions for the position. In addition, personnel cost analysis allows for analysis and forecasting of past, present, and future personnel costs and provides the basis for corporate cost analysis through an integrated ERP environment [18].

Recruitment management. A company's workforce should be seen as the most important investment. Human resource decisions are about the success and competitiveness of a company. Remaining competitive means that a company has a set of effective tools to identify talent. People are a company's most important resource. Good people are the only way to ensure a company's lasting competitiveness. Recruitment systems generally support the recruitment process in several ways: they optimize the recruitment process and reduce operational workload; they reduce recruitment costs by scientifically managing the cost of recruitment; they provide information to support the selection of hiring positions and effectively help the company in its talent search [19].

Payroll accounting. The flexible and efficient payroll system can develop payroll accounting methods according to the different payroll structures and processing flows of the company across regions, departments, and jobs. Direct integration with time management allows for timely updates to employee payroll dynamics. Manual intervention is reduced, and problems in the interface are eliminated, providing automatic payroll deductions, employee loans, and other functions. Payroll management can get the required information in advance through payroll simulation runs. The payroll system also has a powerful recalculation function. When the payroll accounting process is completed, the master data of the employee concerning the previous payroll period changes, and the recalculation function is automatically triggered in the next payroll accounting period for correction. In addition, the system can also automatically adjust the salary structure according to the results of employee assessment [20].

Job management. Job management is based on the national or local calendar, flexible scheduling of business operations and workforce schedules, and a comprehensive set of arrangements for employee overtime, work shifts, employee holidays, and employee relief. With the remote attendance system, the actual attendance status of employees can be recorded in the main system. Time data related to employee payroll and bonuses are further processed in the payroll system and cost. The system includes time management as an integral part of the overall system, and this system supports the planning, control, and management processes of the HRM system. Figure 6 shows the optimization rate of the human resource management system.

The ERP system can automatically control the entire process from travel application travel approval to travel reimbursement for workflow control. The entire process

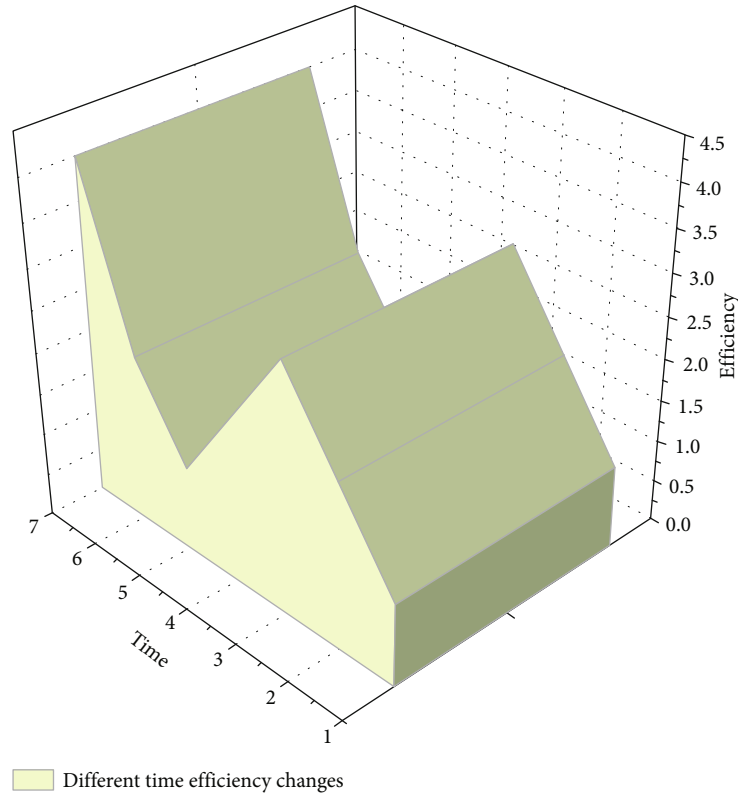


FIGURE 6: Human resource management system optimization rate.

can be completed in the system and through the integrated environment will be accounting data into the financial costing module to go. The previous ERP system was centered on the manufacturing and sales process (supply chain). Therefore, for a long time, the resources related to manufacturing resources have been managed as the core resources of the enterprise. However, in recent years, human resources within the company have become more and more important to the company and are considered to be the foundation of the company's resources. In this context, human resource management has been added to the ERP system as an independent module, and the financial and production systems in ERP form an efficient and highly integrated enterprise resource system [21].

4. Research and Development of ERP Systems

4.1. Study of ERP Systems. The application of ERP reflects the idea of "lean production and agile manufacturing" in supply chain management, allocate resources, and quickly meet market demand. The supply chain is the core competitiveness of modern enterprises; the ERP system achieves the enterprise supply chain refinement and collaborative management and improves the competitiveness of enterprises. The ERP system has a fine planning system, including the main production plan, material demand planning, procurement planning, sales planning, financial budget, and human resource planning. These planning and value control functions are used in the enterprise's entire supply chain man-

agement for the enterprise production and operation with "prior control" conditions. The formula for calculating time is the same time:

$$\text{Time} = \frac{1}{n} \sum_{i=1}^n (X_i - \bar{X})^2. \quad (2)$$

ERP can synchronize business information with financial information in real time; enterprise management can analyze data and financial analysis functions through ERP system, real-time monitoring of procurement, production, sales, and traceability of business activities, for the enterprise's production and operation and human resource management for "control in the matter," and to make timely decisions. For timely decision-making, Table 1 is the comparison of the relationship between time and distance in inventory management under ERP [22].

ERP applications are customizable and flexible, and at the early stage of ERP system design, enterprises can select the functional modules that need to be implemented according to their business characteristics and management control needs and personalize the business processing and flow of the ERP system to effectively support the daily operation and management of the enterprise. In the process of ERP system application, with the business development and management needs, enterprises can adjust the ERP system environment by resetting system parameters, system upgrades, etc., and if necessary, secondary development of

TABLE 1: Inventory management model under ERP model.

Distance/time	1	2	3	4	5	6	7	8	9	10
10	5	6	7	8	9	10	11	12	13	14
20	5	7	9	11	13	15	17	19	21	23
30	7	8	7	7	7	67	4	2	7	7
40	5	6	7	8	9	10	11	12	13	14
50	8	55	66	3	45	66	34	53	56	21
60	5	66	4	7	10	13	16	19	22	25
70	7	67	12	34	56	44	45	56	45	45
80	5	53	15	24	43	32	43	56	43	21
90	6	23	18	12	34	56	34	56	43	23

the system program to strengthen system functions and improve the integration and refinement of the system to meet the changing needs of business management [23].

ERP uses the idea of planning and control to process, standardize, and refine the management of enterprise operation. In the ERP environment, enterprises can achieve comprehensive control of people, finance, and materials in all aspects such as production, supply, and sales and realize the integration of financial and business processing. The following content analyzes the characteristics of internal control in an ERP environment from the aspects of five elements of internal control, such as control environment, risk assessment, control activities, information and communication, and internal supervision. Table 2 is the comparative data of the respective algorithm functions.

In an ERP environment, the organizational structure of the enterprise is flattened and the quality of the personnel is required to be higher. In the traditional environment, the enterprise internal pyramid structure, through the different levels and functions of each department set up for the daily work of the enterprise to allocate and control, each department's business processing is relatively independent. In the ERP environment, the operation of the enterprise from the departmental functions as the center to the business process as the center is according to the business module to carry out. For example, ERP from procurement to payment, from order acquisition to capital recovery, and other businesses are fully integrated; a variety of business activities are closely integrated with the logistics and capital flow, and information flows together, for the internal transfer of information across functional departments to provide an integrated platform to achieve cross-departmental business processing and information sharing, breaking the original functional departmental compartmentalization and hierarchical division of a clear organizational structure. In the ERP environment, the internal control hierarchy is significantly reduced and the control responsibilities are clearer, which is conducive to the improvement of control efficiency. At the same time, the ERP system can improve the office efficiency of enterprises, so that enterprise managers and employees can use the information system operation to play their part of the function, using system operations instead of manual operations. The human-machine cooperative work mode makes the employees from the complicated manual operation to free, so the enterprise functions

TABLE 2: Efficiency test results of ERP optimization algorithm.

Algorithm/test function	1	2	3	4	5
ISPO	6.45	3.45	3.23	5.67	6.57
TXRP	4.34	4.54	1.23	6.78	5.67
HM-PSO	4.52	3.45	2.34	3.45	6.76
WEIFN	2.34	3.45	3.23	3.54	5.45

should pay more attention to the management function rather than simple transaction processing. In addition, the professionalism and complexity of ERP system operations on the quality of enterprise employees put forward higher requirements: information system management departments need professional and technical personnel to carry out maintenance and management of the system to ensure the safe and stable operation of the system; end-users need to improve the understanding of ERP management ideas and the ability to operate the system based on the original business skills. As the ERP system needs to be upgraded continuously with the changes in business management, employees need to learn continuously to adapt to the changes in system updates. Therefore, the implementation of ERP has put forward higher requirements on the overall quality of enterprise employees, so the human resource management should be more careful [24].

4.2. Optimal Development of the ERP System. This section proposes the content and methods of optimizing enterprise internal control in ERP environment; that is, enterprises should make full use of ERP system functions to optimize internal control measures and analyze the potential risks of each link in business processes from existing business processes, improve relevant management systems, and implement key control points by formulating or designing corresponding manual or automated control measures, to achieve internal control objectives. In addition, enterprises in the ERP environment need to strengthen the internal control of information systems; information system internal control includes general control and application control because the information system application control has been built-in in the system development, so the information system in the daily business management activities of enterprises focused on strengthening the general control of the information system management department, as shown in Figure 7 of the ERP system development flow chart.

In the ERP environment, enterprises should make full use of the ERP system functions for the corresponding development, specifically analyzed as follows.

4.2.1. Optimizing Incompatible Job Separation and Authorization Control Using System Parameters and Permission Settings. Enterprises implementing ERP need to analyze and sort out the incompatible functions in the business process of the system and set up different user logins for different functions, and the interface that each user can operate after logging into the system is different, and the functional scope of the interface is different. For example, the accountant who is responsible for bookkeeping can only perform the bill-making operation after logging into the

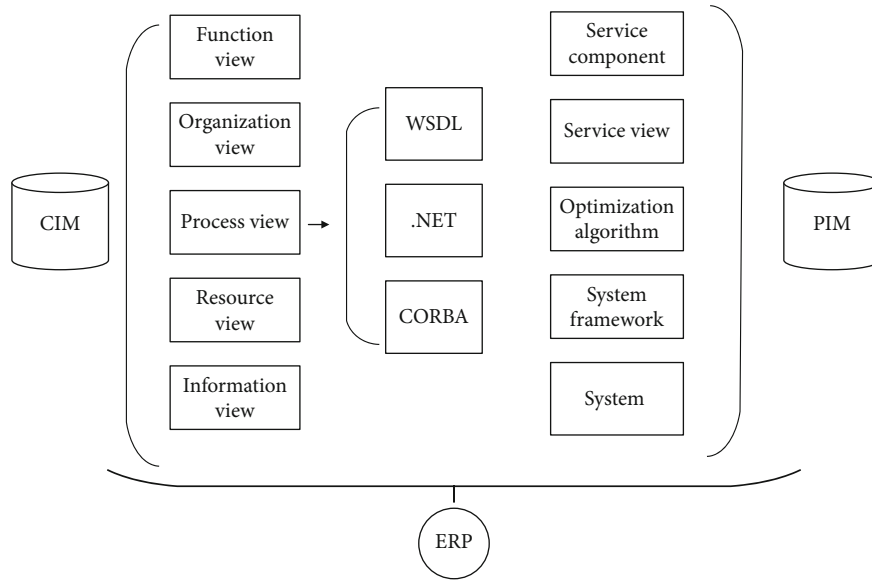


FIGURE 7: ERP system development flow chart.

system and upload the bookkeeping vouchers to the financial controller, who will review the bookkeeping vouchers in his operation interface after logging into the system, and the system does not allow the bill maker and the reviewer to be the same person. Therefore, the implementation of ERP enterprises should be in the full and reasonable use of the ERP system permissions set for the separation of incompatible function control. In addition, ERP for user authorization is through the role or permission parameter file with different permissions granted to different users, after the authorization of the user master data recorded in its authorization information. When a user executes a transaction code, the program corresponding to the transaction code checks the authorization information in the user's master record for permissions, and if the check passes, it means that the user has the operation authority, and the business operation can be carried out smoothly; otherwise, the system automatically terminates the transaction processing and prompts the user to operate without authority. The system's parameterized control of each position and function enables system users to clarify their respective terms of reference and strengthens the control of the corresponding rights and responsibilities of each position through system control.

4.2.2. Optimize Approval Control Using System Approval Process Settings. Enterprises need to embed the approval process of each business link in the ERP system and set the user with approval authority at the approval node, the user logs into the system and carries out the approval operation for the approval transaction to be processed, the system will pass the data to the next link of the approval process according to the approval result, and the corresponding approval data will be saved in the database. The approval function in the ERP system can standardize the approval process of enterprise business processing and improve approval efficiency, which is a powerful tool for enterprise approval control.

4.2.3. Optimization of Accounting System Control Using Financial Management Module. The formula is

$$f(x) = \frac{1}{n} \sum_{i=1}^n X_i^2 \left(\frac{x - \mu}{\sigma} \right). \quad (3)$$

The financial management module can automatically collect the original data and production data generated from sales, purchase, and production activities and use the corresponding data to generate general ledger and accounting reports, avoiding multiple entries of the same data and reducing errors caused by human operations. The organizational structure, accounting system, financial standards, and rules of the enterprise need to be defined in the general ledger module, and all financial-related business information generated by submodules will be passed to the general ledger, which will be processed to generate general ledger data to reflect the financial results of the enterprise. The formula for calculating efficiency is

$$E = \frac{1}{n} \sum_{i=2}^n X_i^2 \frac{x - \mu}{\sigma}. \quad (4)$$

The full and reasonable use of ERP financial management module functions can help enterprises to expand the scope of accounting supervision and control from local to the whole process of business activities. In addition, the accounting information generated by the ERP system is multidimensional and real time, so that the accounting supervision and control functions can be given full play. Enterprises can use ERP systems to extend the scope of accounting supervision and control from the local to the whole process of business activities.

4.2.4. Optimize Property Protection Controls Using Fixed Asset Management and Inventory Management Modules. Fixed asset management in the ERP system is based on fixed asset card management, which helps enterprises to realize

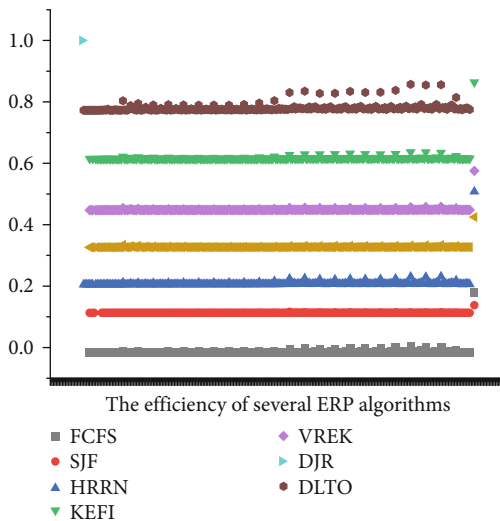


FIGURE 8: The efficiency of ERP system after optimization.

the comprehensive management of fixed assets. The fixed asset management function includes the business processing of fixed asset addition, reduction, original value replacement, asset evaluation, departmental transfer, internal transfer, status change, etc. It also allows the operation of depreciation and provision for impairment following the requirements of national accounting standards. At the same time, the fixed asset management function can help managers fully grasp the current quantity and value of fixed assets, track the use of fixed assets, and strengthen enterprise asset management. The inventory management module can handle the inventory management business of purchasing, production, sales, and other departments and establish inventory files for all materials. Inventory materials can exist in a variety of inventory states, such as regular inventory, vendor-hosted inventory, and in-transit inventory. Different inventory states can be managed separately, and the inbound, outbound, movement, and inventory of inventory materials can be fully controlled and managed. After the implementation of ERP, enterprises should regularly maintain the fixed asset management and inventory management modules of the system to make up for the problems that occur in the operation of the system and optimize and upgrade the system when necessary to make full use of the ERP system functions and strengthen property protection control. Figure 8 shows the results of the efficiency of the ERP system after the optimization is achieved.

5. Conclusion

After the system is optimized, the processing efficiency is higher, and the inventory can be optimized to promote resource conservation. The purpose of building an information management platform for enterprises is to improve long-term management concepts, establish an optimized resource management system, better optimize the allocation of enterprise resources, and enhance core management capabilities. The multifunctional data analysis capability of the ERP system is used to realize the optimization of budget

management in financial management, improve the enterprise budget management system, and better achieve the long-term strategic goals of the enterprise. This paper provides an in-depth overview and analysis of the budget management system of a representative manufacturing enterprise through the perspective of the integration of the ERP system and human resource management and proposes improvement suggestions for the defects and problems that occur in the process of its application, to optimize the resource allocation of the information platform of the enterprise, and proposes how to make the system achieve the management of inventory and the optimization of human resource management. In this way, the enterprise can use the ERP system to achieve optimal benefits, both for inventory management and the management of enterprise manpower. For the application of ERP, I want to enable the entire industry to better optimize the use, so that merchants' inventory processing can be more optimized, and in the future use, the process can reduce losses and promote better development of the industry.

Data Availability

The data used to support the findings of this study are included within the article.

Conflicts of Interest

All the authors do not have any possible conflicts of interest.

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