

Research Article

Refinement Evaluation Method of Financial Management Quality of Listed Companies Based on the ERP Model

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With the development of economic globalization, the trend of internationalization and alliance of large enterprises is becoming more and more obvious, and the competition and cooperation among enterprises are still continuing. In this new historical stage, it is very necessary to ensure the smooth implementation of financial management and coordination with other systems, in line with the times, to establish, improve, and ensure a scientific and reasonable enterprise financial management model and prove its effectiveness. However, the existing research on the specific implementation of the integrated financial management model based on the theory and case studies is not specific enough, the process tracking is not detailed enough, the implementation effect evaluation theory lacks scientificity and integrity in the establishment of the index system, and the evaluation methods are relatively simple. In view of the above problems, this paper proposes the specific implementation steps and problems that need to be paid attention based on the financial management model for large listed companies, establishes the evaluation index system of enterprise implementation by using the method, and quantifies the listed companies before and after the implementation of integrated financial management. The comparisons give credible results. This paper is of great significance for improving the existing performance evaluation system, responding to national policies, promoting the development of enterprise informatization, and improving the success rate and competitiveness of enterprise integrated financial management implementation.

1. Introduction

With the advent of the digital information age, digital transformation of enterprises is an inevitable choice to adapt to the development of the times, and information technology is an important means to help enterprises achieve digital transformation. Digital management can not only realize the integration of enterprise management information, but also help enterprises to achieve a qualitative leap in their management level. As a tool set beyond the scope of management, the ERP system plays a role in driving the efficient operation of the internal processes of the enterprise and revitalizing the enterprise resources, thereby helping the enterprise to successfully realize the digital transformation [1]. In order to adapt to the development of the digital age, many enterprises have begun to improve their daily operation and management levels by building their own ERP systems and fully implementing ERP systems. When most

enterprises go online with ERP systems, due to the limited management foundation and human resources, they choose to launch ERP subsystems one by one to smoothly realize the transformation of information management. As the most important economic management activity of an enterprise, corporate financial management is essentially a work of organizing corporate financial activities and dealing with corporate financial relations, covering all aspects of the company's economic business. Because the management efficiency and operation effect of the company's daily business are closely related to the overall level of the company's financial management system, therefore, enterprises will choose to launch the ERP financial management system first [2].

During the implementation of the ERP financial management system, the advantages of the ERP financial management system cannot be brought into full play because the internal business processes of the enterprise cannot

be fully integrated with the ERP financial management system, which eventually leads to the failure of the ERP financial management system. According to an Accenture research report, nearly 80% of ERP systems have not achieved the expected results after going online. It shows that the implementation of ERP financial management system cannot be accomplished overnight and the system should be upgraded through continuous evaluation and optimization, so that it is possible to enjoy the benefits brought by information integration [3]. However, most enterprises tend to ignore this point when they build their own ERP systems and fully implement ERP systems. There is often a situation of “emphasizing the system, neglecting evaluation and weak optimization,” which goes against the original intention of enterprises to use the ERP system to improve the efficiency of operation and management. Therefore, it is necessary to discuss whether ERP can be better applied to the financial management model, so that the logistics, information flow, and capital flow can be effectively integrated, and it is necessary to study whether the integrated financial management based on ERP can be successfully implemented, what is the effect of the implementation, and whether it can improve the financial management level of enterprises and meet the requirements of rapid development of enterprises. On the basis of discussing the relevant theories, this paper deeply studies the financial management mode and effect of enterprises based on ERP and establishes the financial management evaluation index system. Quantitative evaluation was carried out, and a practical research was carried out on the refined evaluation method of financial management quality of listed companies based on ERP model.

2. Research Status of ERP Financial Management Evaluation Methods at Home and Abroad

Enterprise Resource Planning, referred to as ERP system, refers to the digitalization of enterprise management through the combination of modern information technology and advanced enterprise management concepts. ERP is essentially a thinking mode of enterprise management, which uses the internal and external resources of the enterprise to provide the optimal solution for the daily operation activities of the enterprise, thereby helping the enterprise to achieve the operation and management goals and improve the actual management level of the enterprise [4, 5]. To evaluate the implementation effect of ERP financial management system, it is necessary to identify the relevant factors that affect the implementation effect of ERP financial management system.

Domestic scholars started late to study the factors affecting the ERP financial management system. Zhang et al. summarized the influencing factors that affect the implementation of ERP systems in enterprises as changes in financial organizations, integration of financial systems, optimization of core financial processes, and a perfect evaluation system [6]. Chen Hu collects relevant information by

means of a questionnaire survey and summarizes the factors that affect the implementation of the financial management system into four factors: business process management, system quality, business standardization, and personnel management. Martin assumed the influencing factors of the ERP financial management system, designed a questionnaire, and used a regression model to verify the correlation between the hypothesized influencing factors [7, 8]. He et al. based on the perspective of process reengineering, take the enterprises that implement financial management systems in China as samples and establish an analysis model of influencing factors. Through empirical methods, it is verified that the factors affecting the financial management system of Chinese enterprises include strategic planning, business process management, and organizational structure design [9–11]. In terms of performance, Miao built the performance evaluation system of the enterprise ERP financial management system, hoping to improve the management level of the enterprise through the construction of the performance evaluation system, so that the enterprise can occupy a favorable position in the fierce market competition [12]. In order to evaluate the performance of the ERP system, Liu optimizes the internal process of the ERP, improves the existing information system, and at the same time improves the efficiency of enterprise management and enhances the competitiveness of the enterprise. By introducing the financial management theory of the balanced scorecard, we can obtain which aspects of the enterprise need to be optimized [13]. Zhang et al. also constructed an ERP system evaluation system based on the balanced scorecard to evaluate and analyze the implementation performance of China Unicom’s ERP system and put forward optimization suggestions after calculating the membership of each evaluation index [14]. Pan used the grey fuzzy correlation method based on the balanced scorecard to analyze the difference in the effect of enterprises before and after the implementation of the ERP system [15]. In terms of influencing factors, after analyzing the main influencing factors of the enterprise ERP financial management system, Li evaluated the situation of the ERP financial management system during the use period and weighted the obtained evaluation results, so as to obtain the time to get the weighted evaluation results. Then, the contribution is evaluated by introducing weights, and finally the financial management system is evaluated based on the dynamic weighted evaluation sequence [16]. Huang et al. built an index system composed of three dimensions: ERP basic operation, comprehensive benefits, and personnel training and growth and used the evaluation system to evaluate the application effect of the ERP system of supply chain enterprises, so as to improve the evaluation ability of supply chain enterprises to the ERP system [17].

In the 1980s, foreign scholars’ research on ERP financial management system gradually deepened. Three scholars including Mudimigh et al. discussed ERP system, financial management, and system integration, respectively, and proposed the fact that ERP financial management system should be based on ERP software in the construction process. Based on the financial data as the core, the integration advantages of the ERP system can be realized [18]. On the

basis of decision support theory, Elisabeth emphasized that the ERP financial management system should meet the process-oriented characteristics and further put forward the view that the system process should be optimized when improving the function of the financial management system [19]. Based on three theories: the urgency of the foundation, the state capability of the national implementation plan, and the technical cooperation between tasks, Trkman proposed the fact that enterprises should continuously improve and optimize the cooperation between business process tasks and management cycles, so as to make the business management reach the best state [20]. In order to make ERP effectively implemented after the introduction, Rajan CA uses TAM (Technical Acceptance Model) to analyze the factors affecting ERP implementation and also tries to analyze the impact of ERP system on performance and work efficiency [21]. Through investigation and research on the types and characteristics of enterprise financial management systems, Zhi proposes how to build an enterprise ERP financial management system based on the ERP environment and the importance attached by senior managers to the construction of ERP financial management systems to promote the development of enterprise financial management. Basic requirements and other viewpoints are found in [22]. Lin analyzes the ERP financial management system in the shipping industry, proposes how to build the ERP-based financial management information management system for shipping companies, and designs its business process in detail. Finally, the designed system is tested [23]. The evaluation of ERP abroad has formed a relatively mature theoretical system, mainly including the ABCD evaluation system and the evaluation of the three parts of the ERP system use purpose, ERP operation problem handling, and factors affecting the success of ERP implementation formulated by the American standardization organization system. ABCD evaluation system mainly includes five research areas: strategic planning, continuous optimization of system quality, development of new products, plan execution, and control. By elaborating the content of each part in detail, explaining the problems involved in this part and the differences in its characteristic attributes between different levels of A, B, C, and D, a more comprehensive problem is drawn, and the questions raised will be discussed and broken down into several components. For example, taking the strategic planning section, first, grade each subquestion of the strategic planning; then divide the strategic planning into four different levels, A, B, C, and D. Level A: strategic planning development and implementation is an ongoing process that drives people's decisions and actions, reflecting a "customer first" perspective. Whether all employees of the company can clearly express the company's purpose, long-term planning and strategic goals is as question. Level B: the formulation and implementation of the strategic plan are a formal matter that should be developed by the company's senior decision makers and middle managers and should be carried out at least once a year. When making decisions based on a strategic plan, the company should enable employees to understand the company's basic purpose and long-term planning. Level C: even though the company

seldom formulates and uses strategic planning to make decisions, it can still smoothly make decisions related to the direction of the company's operations. Level D: the company has never developed a strategic plan. And put forward comprehensive questions to judge whether the enterprise has achieved the expected effect after implementing the ERP financial management system; finally, evaluate each comprehensive problem. The evaluation result here is not the average score for each small problem, but it is to provide the basis for the comprehensive score [24].

From the above research results, it is found that domestic and foreign scholars have carried out certain research on the ERP financial management system and the evaluation and optimization of the ERP financial management system. And it can be found that domestic and foreign scholars' research on ERP financial management system is mostly based on the analysis of its internal structure and how to achieve coordination between systems. Conduct research and develop a relatively complete evaluation system to meet the evaluation needs. However, in the selection of research objects, most of them are large enterprises in developed countries, which generally have the characteristics of large scale, clear process, and standardized management. However, domestic scholars started late, and so far they have not formed an authoritative, systematic ERP financial management evaluation system that can meet the needs of enterprises. Most of the researchers' research on the evaluation system is only in the initial stage. By summarizing the research results of ERP financial management optimization at home and abroad, it is found that foreign researchers pay more attention to explore the reasons for the low success rate of system application and try to formulate scientific and effective solutions from a macroperspective to realize the optimization of ERP system. However, domestic scholars mostly explore the optimization of ERP financial management system from the microperspective of the enterprise level. By analyzing the application status of the system and proposing solutions for the existing problems to achieve system optimization, the solution is more practical.

3. Implementation Analysis of ERP Integrated Financial Management System

ERP financial management system: as far as listed companies are concerned, the accounting module used to integrate financial data is the basis for the normal operation of the financial management system, the fund management module is an important part of the operation of financial management, and budget management is the basis for enterprises to carry out financial management and also is an important means of financial management. In a word, the accounting module, fund management module, and budget management module not only connect the beginning and end of the enterprise financial management work, but also run through the most important components in the ERP financial management system of listed companies: accounting module, capital management module, and the application status of the comprehensive budget management module which is described [25]. Generally, the accounting

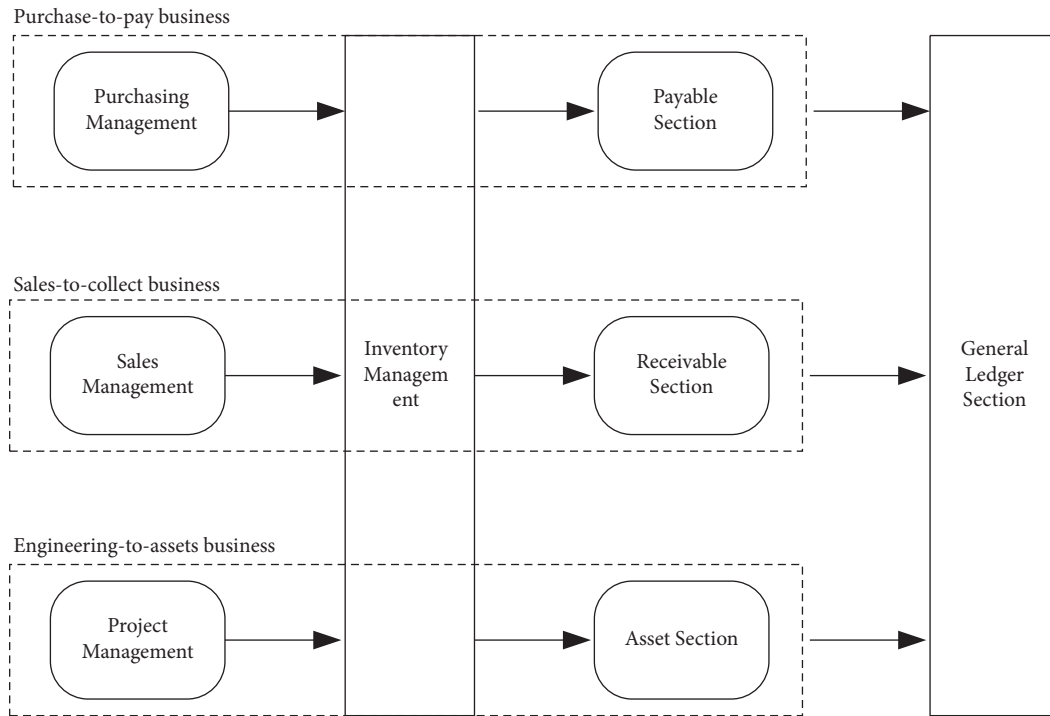


FIGURE 1: Integration diagram of the general ledger section of the accounting module composition.

module of listed companies uses the Oracle suite, which realizes the integration between the module components and the functional upgrade of some blocks. The accounting module includes general ledger, accounts receivable, accounts payable, assets, purchases, and projects. The relationship between these components and the general ledger blocks is shown in Figure 1.

- (1) **General ledger section:** the general ledger section is the core of the accounting module. Basic elements such as accounting subjects, accounting periods, currency, and book sets in the system are set in the general ledger section. Each submodule will transfer the generated accounting entries to the general ledger block during business processing, generate journals, and update account balances to generate subsidiary ledgers, general ledgers, and various financial statements. Since the financial information of the enterprise will be automatically posted to the general ledger section through the system, and other submodules will also share data with the general ledger section, the general ledger section should be the best platform for querying company information.
- (2) **Accounts receivable segment:** the accounts receivable section is mainly used to manage the customer's current business, business collection, and settlement business, including the management and preservation of customer data and information, the issuance of sales invoices integrated with the BOSS system, and the management of customer accounts receivable and payment collection information, recording receipt vouchers and controlling the aging of customer

arrears. At the same time, the accounts receivable section can automatically import the data of the business daily report interface provided by the BOSS system into the business accounts receivable invoice and import the bank receipt information into the accounts receivable section through this interface and then batch verification of invoices received.

- (3) **Accounts payable segment:** for listed companies, dealing with suppliers is a very important business activity for the company. The payable section is used to manage the business dealings with suppliers. The section contains basic information about suppliers such as supplier locations, contacts, and bank accounts. For the invoice management of the business transactions of the enterprise, the invoice needs to be paid after a strict approval process. The payment method can choose single payment or batch payment.
- (4) **Assets sector:** it is mainly used to manage and account for various assets of the enterprise and is specifically used to process various businesses in the process of enterprise asset management in batches, such as processing the increase and decrease of assets, depreciation and amortization, and provision for impairment. In each accounting period, as long as the financial staff submits the asset processing request, the asset section will automatically accrue depreciation or amortization, transmit the relevant entries to the general ledger section, and automatically update the asset account balance sheet. The asset section is integrated with the accounts payable section and the project section. In the asset section, users can find asset information at any time, such as

the original value of the asset, accumulated depreciation in use, asset age, remaining life, storage location, custodian, and asset status, and can update asset information.

4. Refinement Evaluation Method of EPR Integrated Financial Management Quality Based on ISM-ANP

Because of its unique practicality, the integrated financial management based on EPR has gradually attracted the attention of relevant institutions all over the world and has carried out extensive research. There are few studies on the evaluation of ERP integrated financial management implementation, but it is very important. This paper combines the integrated financial management mode to bring changes to the enterprise compared with the traditional financial management mode, extracts the relevant performance factors, establishes the enterprise implementation evaluation index system, and carries out the weight calculation, trying to quantify the implementation effect of the integrated financial management based on ERP.

4.1. Establishment of ERP Implementation Evaluation Index System. According to the industry situation of electronic manufacturing, after consulting relevant experts and implementing ERP-based integrated financial management, the following indicators of the industry will be greatly affected:

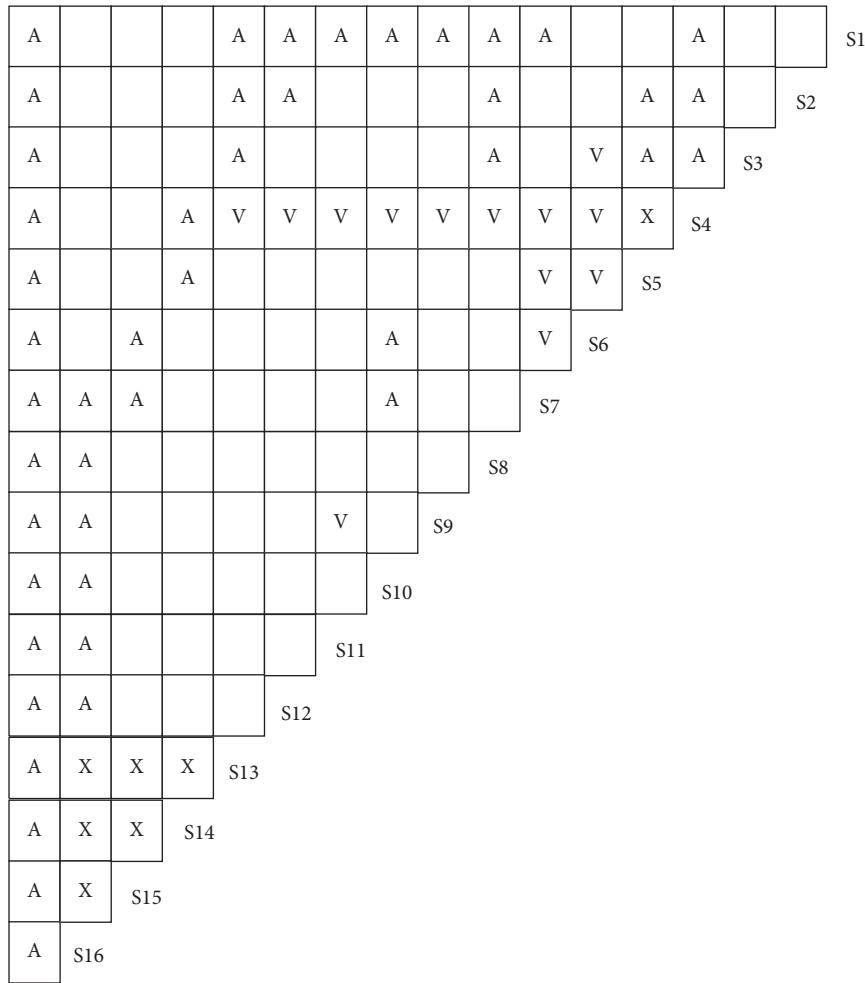
- (1) *Management Benefits.* (1) After the implementation of integrated financial management, the network and software are used to standardize the management of the enterprise, straighten out the management process of the enterprise, and make the inventory cost of the enterprise drop significantly. Through effective daily supervision, the purpose of reducing inventory costs and saving funds has been basically achieved. At the same time, due to the constraints of the network and software, the occurrence of enterprise violations and illegal acts has been effectively prevented, and the work efficiency of employees has been greatly improved, thereby increasing management benefits. (2) The information and data in the system can be used to continuously adjust the ratio of inventory to funds, increase the turnover frequency of products as much as possible, increase the turnover rate of funds, and improve the efficiency of the use of funds. And the credit control module of the system can be used to monitor the accounts receivable and accounts payable in real time, strengthen the analysis of information, prevent the occurrence of "bad debts," and improve the credit of the enterprise. (3) With the development of the project, especially the continuous improvement of the process, it overcomes the randomness of the management behavior of the managers and prompts the employees to gradually change the logic of

dealing with things that they used to think in the past and understand that the work they do is not only about the existing operations. When the process is moved into the system, it is more important to find the unreasonable part of the original work and to integrate the advanced management ideas and methods into the future process. It helps to improve the team awareness of employees and makes the whole company form an excellent management team.

- (2) *Economic Benefits.* (1) After using the system, the entire production process of the enterprise is organically combined, so that the enterprise can effectively reduce the inventory, ensure stable logistics to support normal production, improve efficiency, reduce the enterprise's inventory investment, improve the inventory turnover rate, and effectively reduce capital occupation. (2) Reduce the phenomenon of delayed delivery and improve the level of on-time delivery. From the beginning of the product sales plan, it manages and counts various pieces of information about its sales products, sales areas, and sales customers and makes a comprehensive analysis of sales volume, amount, profit, performance, and customer service. The inventory is steadily reduced, the service level of the enterprise is greatly improved, and the delay rate is reduced, thereby greatly improving the credibility of the enterprise. (3) The procurement lead time is effectively shortened. With timely and accurate production plan information, purchasing personnel can concentrate on value analysis, source selection, study negotiation strategies, understand production problems, can determine reasonable order quantities, excellent suppliers, and maintain the best safety reserves. Provide ordering and acceptance information, track and urge materials purchased or outsourced for processing, and ensure the timely arrival of goods. This shortens the procurement time and saves procurement costs.

After the implementation of ERP-based integrated financial management is completed, the evaluation before and after the implementation is carried out, and the evaluation factors proposed before are comprehensively analyzed, the main indicators are extracted, and a comprehensive performance evaluation system is established. The evaluation factors mainly include capital turnover, work efficiency, management Informatization level, employee quality, customer satisfaction, corporate image, reduction of downtime, shortened procurement lead time, reduction of delayed delivery, reduction of inventory, reduction of management personnel, management benefits, growth benefits, customer benefits, economic benefits, and enterprise integration benefits.

4.2. Implementation Effect Evaluation Based on ISM-ANP. Set up an IMS evaluation structure team, according to the calculation requirements, after expert discussion, the final



Enterprise comprehensive benefit

FIGURE 2: Integration diagram of the general ledger section of the accounting module composition.

indicators will be listed as follows: S_1 capital turnover, S_2 work efficiency, S_3 production capacity, S_4 management information level, S_5 staff quality, S_6 customer satisfaction Degree, S_7 corporate image, S_8 reduce downtime, S_9 shorten procurement lead time, S_{10} reduce backorder, S_{11} reduce inventory, S_{12} reduce management personnel, S_{13} management benefits, S_{14} growth benefits, S_{15} customer benefits, and S_{16} economic benefits and enterprises overall benefit.

According to the suggestions of experts, establish the relationship diagram of the mutual influence of various indicators, as shown in Figure 2. “V” means that the row factor has a direct or indirect influence on the column factor, “A” means that the column factor has a direct or indirect influence on the row factor, “X” means that the row and column influence each other, and blank means that there is no mutual influence between the row factor and the column factor.

Calculating the logical relationship of the mutual influence factors of the enterprise comprehensive evaluation index of the reachability matrix R and L , the adjacency matrix A can be obtained. Let $A_1 = A + I$, $A_2 = (A + 1)^2$, ..., $A_r = (A + 1)^r$. Then, after the Boolean algebra operation rules, $R = A_2$ is obtained, the row and column factors of the

reachable matrix R are the same, and it is a 17th-order square matrix; the arrangement order is S_1, S_2, \dots, S_{17} . The element corresponding to 1 in the new array indicates that the factor of the row has an influence on the factor of the column and the element of 0 means that the factor of the row has no influence on the factor of the column.

The evaluation model is obtained by ISM-ANP method, MATLAB programming, and SD software, S_1 capital turnover, S_2 work efficiency, S_3 production capacity, S_4 management informatization level, S_5 staff quality, S_6 customer satisfaction, S_7 corporate image, S_8 reducing downtime and waiting for materials, S_9 shortening procurement lead time, S_{10} reducing delayed delivery, S_{11} reducing inventory, S_{12} reducing management personnel, S_{13} management benefits, S_{14} growth benefits, S_{15} customer benefits, S_{16} economic benefits, and S_{17} various indicators of comprehensive enterprise benefits. The weights are shown in Table 1.

After the implementation of the integrated financial management model based on the increase of each indicator: $J = R * \omega = 0.3409 = 34.09\%$.

$R = (10\%, 50\%, 30\%, 10\%, 80\%, 50\%, 10\%, 30\%, 50\%, 50\%, 60\%, \text{ and } 30\%); \omega = (0.1776, 0.0959, 0.0763, 0.1216,$

TABLE 1: ERO implementation evaluation model of the final weight of each index.

Name	Normalized by cluster	Limiting
Production capacity	0.50774	0.177629
Work efficiency	0.27419	0.095924
Capital turnover	0.21806	0.076286
Employee quality	0.48486	0.121581
Management informatization level	0.51514	0.129172
Corporate image	0.71118	0.026877
Customer satisfaction	0.28882	0.010915
Management personnel cost	0.17364	0.062792
Inventory cost	0.25569	0.092463
Backorder cost	0.12497	0.045192
Procurement lead time	0.14627	0.052894
Downtime cost	0.18506	0.066920
Manufacturing cost	0.11436	0.041355

0.1292, 0.0269, 0.0109, 0.0628, 0.0925, 0.0452, 0.0529, 0.0669, and 0.041). It can be seen from the above calculation that, after the refined evaluation method of financial management quality based on the ERP model, the comprehensive performance of the enterprise is improved compared with that before the implementation of the model. Factors and the dependence and feedback relationship between factors can be considered, and the effect of implementation can be more clearly defined.

5. Conclusion and Outlook

This paper mainly expounds the basic theory of ERP integrated financial management implementation, the necessity of implementation, the implementation process and safeguard measures, etc., and puts forward the important factors that affect enterprise performance after the implementation of ERP integrated financial management. According to these factors, the evaluation index system is designed, the rationality and scientificity of the index design are verified by MATLAB software, the weight of the evaluation index system is calculated by the ISN-ANP method, and the index is explained and analyzed in detail. Finally, taking a listed company as an example, through the research on the implementation process of the integrated financial management based on the company, it analyzes the existing problems, the process of implementation, and the results of the implementation before the company does not implement it and finally draws the conclusion that the integrated financial management is based on the company's refined assessment method of financial management quality. The experimental results show that the comprehensive performance of the enterprise after implementing the integrated financial management quality refined evaluation method is 34.09% higher than that before the model is not implemented.

5.1. Summary

- (1) The process and safeguard measures for the implementation of integrated financial management are

proposed. On the basis of summarizing the theories of EPR and integrated financial management, this paper expounds the concept and characteristics of ERP-based financial management. These theories will lay a good foundation for the successful implementation of ERP projects.

- (2) ISM-ANP method is used to solve the problem of establishing the effect evaluation system of ERP integrated financial management implementation.

This paper introduces the ISM-ANP method and applies it to the ERP implementation effect evaluation index system. The combination of ISM and ANP can comprehensively consider various clear or unclear factors that affect enterprise performance and can consider the dependence and feedback relationship between factors, which can better solve the problem of ERP implementation effect. In this paper, referring to the industry situation and according to the suggestions of experts, the ISM-ANP method is applied to establish the implementation effect evaluation index system suitable for the electronic manufacturing industry. The use of MATLAB software and SD software for calculation saves time is beneficial to the ISM-ANP analysis method. Further promotion and application provide a reference index system for the relevant listed companies on the refined evaluation method of ERP financial management quality.

5.2. Prospect. Due to the authors' lack of practical experience and limitations of various conditions, although this paper has carried out research in terms of method and empirical analysis, there are still many deficiencies in the implementation process model and implementation evaluation index system of Chen Company, which need to be studied by other scholars' conduct further research.

- (1) Since the factors affecting enterprise performance after the implementation of ERP are quite complex, there are a large number of qualitative indicators, which makes the artificial selection of indicators not particularly objective, and the analysis of the factors related to the implementation effect is relatively superficial, so the evaluation of such indicators is not very objective. Whether the selection can accurately evaluate the implementation effect still needs further research and analysis.
- (2) The evaluation model and data sources need to be further improved. This paper adopts the Delphi method to assign the relationship between the indicators and the relative importance assignment by experts, which may have a certain degree of subjectivity, the reliability of the collected data is not high, and there are defects of subjective factors, which requires follow-up completely.

Data Availability

The dataset can be obtained from the corresponding author upon request.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

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