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Retraction

Retracted: Supply Chain Management System for Automobile Manufacturing Enterprises Based on SAP

Wireless Communications and Mobile Computing

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This article has been retracted by Hindawi following an investigation undertaken by the publisher [1]. This investigation has uncovered evidence of one or more of the following indicators of systematic manipulation of the publication process:

(1) Discrepancies in scope
(2) Discrepancies in the description of the research reported
(3) Discrepancies between the availability of data and the research described
(4) Inappropriate citations
(5) Incoherent, meaningless and/or irrelevant content included in the article
(6) Peer-review manipulation

The presence of these indicators undermines our confidence in the integrity of the article's content and we cannot, therefore, vouch for its reliability. Please note that this notice is intended solely to alert readers that the content of this article is unreliable. We have not investigated whether authors were aware of or involved in the systematic manipulation of the publication process.

Wiley and Hindawi regrets that the usual quality checks did not identify these issues before publication and have since put additional measures in place to safeguard research integrity.

We wish to credit our own Research Integrity and Research Publishing teams and anonymous and named external researchers and research integrity experts for contributing to this investigation.

The corresponding author, as the representative of all authors, has been given the opportunity to register their agreement or disagreement to this retraction. We have kept a record of any response received.

References

[1] P. Lin, M. Shu, B. Hsu, C. Hu, and J. Huang, "Supply Chain Management System for Automobile Manufacturing Enterprises Based on SAP," *Wireless Communications and Mobile Computing*, vol. 2022, Article ID 5901633, 10 pages, 2022.

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Research Article

Supply Chain Management System for Automobile Manufacturing Enterprises Based on SAP

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The heavy-duty truck industry has always been regarded as an "economic vane," and as the carrier of production materials, its degree of cold and heat can better reflect the quality of the macroeconomic environment. The SAP system is currently the ERP software with the largest functions and the most sales and has been widely used by large domestic and foreign manufacturing enterprises. Because of its specific development for enterprises, it is also the most expensive ERP software in the world. This research integrates the existing information resources, takes SAP (system applications and products in data processing) system as the enterprise's information platform, unifies the information platform into SAP system by integrating the existing information resources (financial system, logistics system, cost control system, production control system, etc.), avoids the information island phenomenon as far as possible, and finally realizes the integrated and unified enterprise information management, which is convenient for the rapid traceability of historical data, providing the best decision analysis method for managers. It is possible to eliminate all non-value-added operations in the value chain, find out the point of cost reduction and efficiency increase, comprehensively optimize the production value chain, improve production efficiency, and finally achieve the purpose of this book. The project implementation of automobile company adopts independent minicomputer system (HP server), with SAPR/3 system as the core and C/S (customer/service) architecture, so as to gradually expand the system function in the future. From the comparison before and after the launch of the SAP project, the above two indicators have increased by 1.5 times, the order fulfillment rate has increased from 30% to 45%, and the timely delivery rate has increased from 60% to 90%. Effective cost control can reduce costs, produce products with larger output and better quality at the same cost, and enable enterprises to maintain an advantage in the competition; effective cost control can also enable enterprises to develop a variety of configurations at the same cost. Products meet the individual needs of customers. The design of this article makes the company's supply, production planning, logistics, and demand synchronized and integrated.

1. Introduction

Based on the solution, implementation model and elements of the SAP system activity-based costing method, as well as the implementation method of each element in the module, formulate the implementation standard and standard determination method of each element in the module and find and analyze new solutions and existing cost accounting methods. The average interest rate of automobile manufacturing industry is reduced. In order to make the enterprise have enough competitiveness and healthy long-term development, it is more important to improve the inventory management level and reduce the enterprise cost. Many production-oriented enterprises are faced with the common problems, such as production shortage and waiting for materials, excessive inventory reserve, low inventory turnover rate, and serious sluggish phenomenon. Inventory proportion is high, there are many kinds, and the management is difficult, so the research on inventory management of automobile manufacturing enterprises has extensive reference significance [1]. Financial general ledger (manually processed business accounting vouchers, which can be queried through subject details), detailed data (supply chain module picking details, income details, etc.), and cost drivers are calculated through statistical indicators under the activity-based costing method and other data.

This study selects the successful case of SAP management system implemented by a medium-sized car manufacturer, an automobile company, to analyze its successful experience, hoping to inspire and help similar enterprises. Relatively speaking, the level of manufacturing industry in developed countries and regions is higher than that in developing countries. According to the actual situation of automobile manufacturing plants, the existing logistics distribution system is integrated, and a set of more suitable overall solution for automobile production control and logistics distribution system is formulated, which lays a good foundation for improving the level of workshop control and logistics management [2]. This research puts forward the safeguard measures for automobiles to implement the standard activity-based costing method from four aspects: enterprise organization, activity-based costing system, personnel management and training, and implementation process.

With the substantial improvement of production technology and management level, the automobile market and consumption environment have been greatly improved, heralding the arrival of China's automobile consumption era. Croxton et al. provided the strategy and operation description of each of the eight supply chain processes determined. Although he provides a series of opportunities for researchers to further develop the field, the research process lacks data [3]. The main purpose of Samaranayake is to document the research related to the development of the conceptual framework of the supply chain. The framework he proposed is based on a unified structured technology, which combines the bill of materials, warehouse list, project network, and operation routes in the manufacturing and distribution network into one structure. He described the framework and illustrated digital examples in the manufacturing and distribution environment. Each network in the supply chain in his research provides integrated methods for planning and executing many components and can provide visibility, flexibility, and maintainability but is not certain to further improve the supply chain environment [4]. Wu believes that as the traditional supply chain becomes more and more intelligent, there is an unprecedented opportunity. He researches and explores the status quo and remaining issues of intelligent supply chain management. In addition, five key research topics were formulated and studied. According to the review questions defined in the research, he reviews, classifies, and analyzes the research in the above-mentioned subject areas. Although the topic of convergence of atoms and numbers in his research has attracted more and more attention [5], Gold mentioned that the endorsement of the point of view may dissolve the firm pursuit of profit and other economic performance goals in order to recall the real problem. Although he discussed how far the acknowledged theoretical point of view has taken root in the European institutionalized corporate social relations tradition, it cannot be regarded as a rediscovery of the true European manufacturing business [6]. With the increasing awareness of environmental protection in countries around the world, the auto industry is bound to face new rectifications and challenges. For auto companies, how to effectively control costs during their operations is an important issue that cannot be ignored.

How to scientifically select suppliers as strategic partners of enterprises, strengthen information sharing and information exchange capabilities between enterprises and suppliers, and achieve seamless connection of supply chain systems has gradually become a new demand for enterprise procurement management. This study mainly discusses the design and implementation of supply chain management system for automobile manufacturing enterprises based on SAP. This research integrates the existing information resources, takes SAP system as the enterprise's information platform, unifies the information platform into SAP system by integrating the existing information resources (financial system, logistics system, cost control system, production control system, etc.), avoids the information island phenomenon as far as possible, and finally realizes the integrated and unified enterprise information management, which is convenient for the rapid traceability of historical data, providing the best decision analysis method for managers. The project implementation of automobile company adopts independent minicomputer system (HP server), with SAPR/3 system as the core and C/S (customer/service) architecture, so as to gradually expand the system function in the future. According to the idea of ERP (Enterprise Resource Planning) management system and combined with the actual situation of the enterprise, the functions of the system include warehouse area management, material basic information management, inventory operation management, inventory operation management, and statistical query management. The process of material information input can transfer material master data information with SAP system through blockchain technology. This study is helpful to provide guidance for the long-term development of enterprises. From the perspective of sustainable supply chain partnership, the determination principles of sustainable supply chain partners and the main factors affecting partner selection can be analyzed, and the evaluation index system of sustainable supply chain partner selection is established accordingly.

2. Supply Chain Management of Automobile Manufacturing Enterprises

2.1. SAP. SAP (system applications and products in data processing, data processing systems, applications, and products) is the leader among ERP software vendors. SAPR/3 system (SAP's flagship product) is a standard enterprise ERP application system product. Its main function modules include SD (sales and distribution), MM (material management), PP (production planning), PM (factory maintenance), HR (human resources), and FICO (finance and cost) [7]. The types of production operations supported by SAP ERP are make-to-order, batch production (mass production), contract production, discrete-type production (discrete type), make-to-stock (production by inventory), and so on. Its due industries include automotive, electronics, steel, chemical, and electrical manufacturing. The various functional modules of SAPR/3 have good solutions in many aspects of enterprise management. The SAPR/3 module is structured and can meet the unique needs of enterprise data processing. It is a comprehensive and standard ERP software product [8]. The SAP system is shown in Figure 1. In the B/S mode, the user requests access to many servers distributed on the network through the browser, the browser's request is processed by the server, and the processing result and corresponding information are returned to the browser; other data processing and requests are all done by web server.

In the manufacturing resource system, whether in space or time, the force driving the movement of manufacturing resources should be consistent with the gradient direction of manufacturing resource potential [9]. Therefore, the potential energy of manufacturing resources can be expressed as

$$\mathrm{dM} = f(dv, dp, \mathrm{dH}). \tag{1}$$

Among them, dM is the potential energy of manufacturing resources, and dH is the change of manufacturing resource potential [10]. According to system resource optimization configuration requirements, let

$$\begin{aligned} p(T) &= \sum_{i=1}^{n} p_i M_i, \\ F_1 &= e^{-rt}\left[a_1 F_s + a_2 F_E + a_3 F_0\right]. \end{aligned} \tag{2}$$

Among them, F_1 is the value of manufacturing asset F, which is [11, 12]

$$F = \lambda_1 + \sum_{m=t}^{M} a_n \frac{Y}{Y_m}. \tag{3}$$

The optimal combination model of production unit resources is established [13].

$$\begin{aligned} H(X) &= e^{\lambda} \prod_{n=1}^{N} X_n^{a_n}, \\ \frac{F}{F_i} &= \varphi_i + \sum_{n=1}^{N} A_n \frac{X}{X_i}. \end{aligned} \tag{4}$$

2.2. Supply Chain. Sustainable supply chain management has developed into a unique research field at an exponential rate, but its progress in sustainability has been quite slow, and it has guided companies to integrate sustainability into their operations and supply chains [14]. The theoretical basis for coherence is still missing [15]. According to the funding gaps occurring at different stages in the supply chain process, different forms of financing models can be obtained [16, 17].

$$F_i(X) = e^{\lambda} \prod_{n=1}^{N} X_n^{a_n}. \tag{5}$$

F is the number of products [18].

$$P = \lambda_i + \sum_{n=1}^{N} B_n F. \tag{6}$$

Among them,

$$\begin{aligned} F_t &= F_{i,t+1} - F_{i,t}, \\ X_i &- X_{t+1}. \end{aligned} \tag{7}$$

Determine parameter a by regression identification or DEA method, and set the macroscopic effect function of the q-level system [19]:

$$H_q(X, t) = \int_0^T e^{-rt}\left[A_1 p_E + a A_2 p_E + A_3 p_0\right] F dt + Xt. \tag{8}$$

Among them, r is the bank interest rate, which mainly considers the time value of resource allocation [20]. Then,

$$A = \left[\frac{F_i}{e^{\lambda,t} \prod_{n=1}^{N} P/P_i \alpha}\right]^F. \tag{9}$$

Defined by the resource structure [21]

$$\frac{Y}{Y_i} = \frac{Y_1}{Y_m} + \frac{H}{H_m}. \tag{10}$$

Y is the resource allocation structure [22].

$$Q_E = \frac{1}{\sum_{n=1}^{1} a_n}\left(\frac{X}{X_m}\sum_{n=1}^{N} A + \sum_{n=1}^{N}\frac{S_i}{S} + A\sum_{n=1}^{N}\frac{P}{P_i} + K\right). \tag{11}$$

Suppose K is the unit at i time, then [23, 24]

$$\Delta R = W_t + \Delta N_t + D_t = W_t + \frac{R_1}{R}\Delta R + D_t. \tag{12}$$

3. Experiment of Supply Chain Management System for Automobile Manufacturing Enterprises

3.1. System Design Scheme. Integrate the existing information resources, and use the SAP system as the enterprise information platform. By integrating the existing information resources (financial system, logistics system, cost control system, etc.), try to avoid the phenomenon of information islands, and finally realize integrated and unified enterprise information management, which facilitates

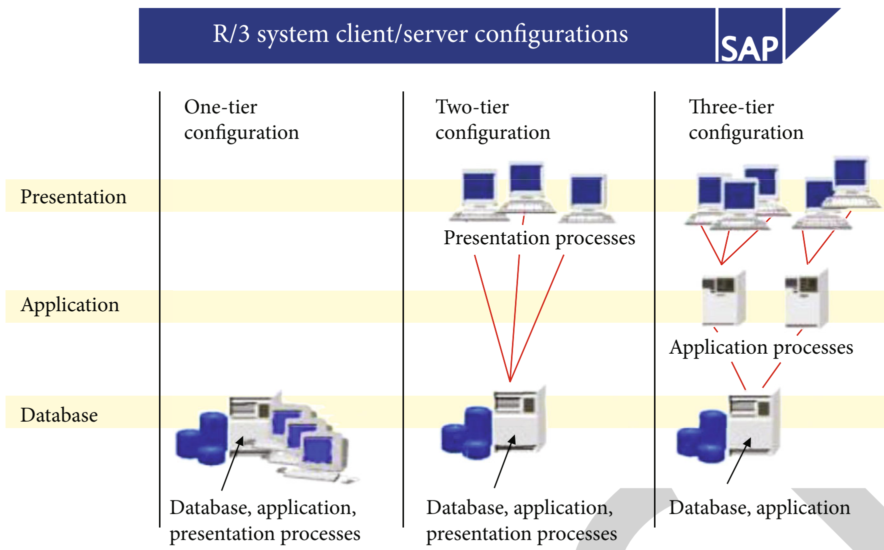

FIGURE 1: SAP system (http://alturl.com/x8bn6).

the rapid system for automobiles and determines to implement the five modules of FI, CO, PP, MM, and SD first.

The following departments are mainly involved in the implementation process:

(1) Financial system: finance department: manage the finance and cost control of the automobile company

(2) Production system

① Production department: responsible for coordinating the sales plan of the sales company, formulating the production plan of the stamping branch, welding branch, painting branch, and assembly branch of the automobile company, and making statistics on the implementation of the production plan

② Purchasing and supply department: responsible for the procurement business and managing the suppliers of a certain automobile company

③ Logistics department: responsible for the management of warehouse operations and logistics distribution of each branch

④ Manufacturing plant (final assembly branch, painting branch, welding branch, stamping branch, online library within each production plant, and work-in-process library between each production plant)

(3) Procurement system

① Purchasing and supply department: supplier management and development, procurement contract maintenance, and procurement business

② Logistics department: responsible for managing warehouse operations and logistics distribution of each branch

(4) Sales system: the sales company of the automobile company is a sales department dedicated to final consumers. However, in this project, the sales company does not implement sales and distribution services for the time being. The main function of the sales system is to sell the products of the manufacturing company to the catalog company and to distribute the catalog. The whole vehicle purchased by the company is sold to the sales company

(5) Other departments

① Technical department: master data management, including material master data, BOM, work center, and process route

② Operation management office: information system, performance appraisal, and comprehensive management

③ Quality department: supplier quality management

3.2. System Architecture Design. The project implementation of the automobile company adopts an independent minicomputer system (HP server and SAPR/3 system as the core), adopts C/S (customer/service) architecture, and gradually expands system functions in the future (B/S structure). Some of the notable advantages of the company are simple optimization and faster and more convenient system upgrades; no matter how many clients need to be upgraded, you only need to upload the required plugins online; the information is fully shared and transparent, not only the inventory information between the various departments of the enterprise sharing, and suppliers can also see all shipping information, avoiding a lot of disputes caused by missing information; network requirements are reduced, saving internal hardware requirements of the enterprise, you can directly query the required data on the browser, and you do not need to store a lot of data yourself. From a comprehensive analysis point of view, the use of the B/S structure is more able to meet the needs of enterprise operation and management. Here, the B/S structure needs to be enabled, and the network topology structure is required to realize the connection of the software and hardware structure of the entire system. The network topology of the system is shown in Figure 2.

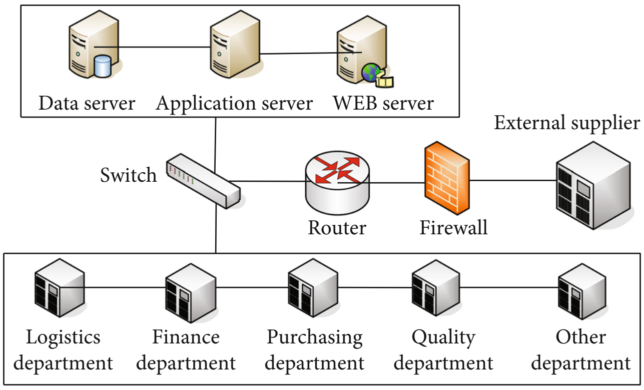

Figure 2: The network topology of the system.

Purchasing and supply department: supplier management and development, procurement contract maintenance, procurement business.

Logistics department: responsible for managing warehouse operations and logistics distribution of each branch.

Technology department: master data management, including material master data, BOM, work center, and process route. Operation management office: information system, performance appraisal, and comprehensive management. Quality department: supplier quality management.

According to the idea of ERP management system, combined with the actual situation of the enterprise, the system includes the following functions:

(1) Warehouse area management: classification and coding management of the warehouse area

(2) Material basic information management: material ABC classification attribute management; provide material classification management. There are various measurement units of materials, and the conversion between measurement units can be realized; the maximum and minimum inventory is set to realize the alarm of missing parts and overflow of materials; alarm: automatic generation of demand order function

(3) Inventory business operation management: inventory management multilevel operation authority to ensure data security; inventory material status query, understand the current available material quantity, and the status of broken scrap, occupancy, and order; automatically generate operation vouchers and query them as inventory operation records; basis: query previous inventory operation records

(4) Inventory job management: inventory plan preparation and direct printing of inventory table; support cycle inventory method and freeze inventory method

(5) Statistical query management: provide multiple combinations of query, inventory status, supplier delivery status, customer sales quantity query, etc.

3.3. System Function Module Design. According to the company's existing SAP system, the E-supply system, and the customer's KMS Kanban pull system that are not fully used, a simple and easy-to-operate inventory management system is designed on the basis of these three systems. It can realize basic functions such as management of enterprise internal inventory, customer receipt and reconciliation management, and supplier delivery reconciliation management, which brings opportunities for the small-scale A company to be quickly put into use. The functions of each module of the information system are introduced as follows:

(1) System management module

(i) Modify personal information

(ii) Allocate system usage authority of each functional department. Planner functions: can operate each module, maintain the main basic data, assign management authority, inventory management, inventory query statistics; information officer: inventory document entry, order and transfer of goods, plan outbound warehousing document entry, inventory query

(2) Basic data maintenance module

(i) Material information input: including material name, material number, project name, part number, supplier name, unit packaging quantity, safety stock quantity, and other information input, delete, modify, query, and exchange material master with SAP system data information

(ii) Location information input: location number, location category, material name, and material classification

(iii) Customer information query: customer information and shipping orders are directly obtained by the KMS Kanban pull system

(iv) Supplier information query: supplier information is obtained from the E-supply system

(v) Beginning inventory entry: the initial part inventory quantity, set the maximum inventory and minimum inventory

(3) Inventory counting module

(i) Preparation of inventory plan: material name, material category, and inventory specification

(ii) Inventory list entry: part number, part name, part category, and location number

(iii) Inventory confirmation: initial quantity, reexamination quantity, draw quantity, and confirmation

(iv) Inventory query: part name, part number, inventory quantity, and location number

(4) Inventory business module

(i) Finished product delivery: printing of finished product delivery note, printing of stocking list, delivery confirmation

(ii) Finished and semifinished product warehousing: finished product warehousing and semifinished product warehousing, finished product material number, quantity

(iii) Order entry: part number, part name, date, and quantity

(iv) Disposal of scrap list: part number and location

(v) Planned outbound and outbound order: material number, material name, applicant, and date

(5) Inventory query statistics module

(i) Inventory status query: query which location the part is in, which supplier it belongs to, and the inventory quantity

(ii) Inventory operation query: what operations have been performed on the part, as well as the operator and date of operation

(iii) Material classification query: the category of the material, whether it is a raw material

(iv) Inventory warning: if the quantity of materials is less than the minimum inventory and greater than the maximum inventory, the shortage alarm and overflow alarm are required

(v) Inventory balance query: query the remaining inventory quantity of each material, and adjust it in time

(vi) Statistical query: summary of monthly material storage and material consumption

3.4. Strategies Implemented by SAP. Implementation strategies include overall implementation and step-by-step implementation. The overall implementation means that all processes and system solutions are designed, implemented, and delivered at the same time. Step-by-step implementation refers to the process, and system plan is divided into several components; each part is designed, implemented, and delivered in batches according to the order of completion. The overall implementation requires more resources in a certain period of time, but the overall implementation time is shorter. Step-by-step implementation is mainly used for projects with limited resources. It requires less investment in a certain period of time, but it will prolong the implementation cycle of the project. Based on years of project experience, the implementation team believes that the overall implementation efficiency is better than stepwise implementation.

(1) Using a step-by-step implementation strategy, the system schemes completed in the previous batch are likely to be readjusted during the design and implementation of the latter batch of schemes. Moreover, every time the system function is expanded, the whole system scheme must be reintegrated test to ensure the integration of the system, and the users must also gather for retraining. These repetitive tasks will consume time. The overall implementation strategy is adopted, all processes are defined in the same time period, all system solutions are designed, implemented, and tested in the same time period, and all user training and permission definitions are also completed in the same time period, thereby avoiding step-by-step implementation causes rework problems

(2) Using a step-by-step implementation strategy, the project implementation team will face the dual work pressure of support and implementation within the same time period. It will not only provide support for the system that has been put into use but also carry out the design and development of new functions. On the contrary, the overall implementation strategy clearly defines the main tasks and key submissions of each stage. The project team members only need to focus on the most important tasks in this stage within the same time period, and the quality of work can be fully guaranteed

(3) Adopting a step-by-step implementation strategy will take up more time for project team members and will affect the normal operation of the enterprise for a longer time. With the overall implementation strategy, with the exception of some support personnel, most members of the project team can be released to invest in other work or projects after the completion of the system support handover. Based on the above considerations, the automobile company adopts an overall implementation strategy, which is conducive to shortening the project time, saving project costs, and improving implementation efficiency

4. Results and Discussion

4.1. SAP System Usage Analysis. The importance of ERP training SAP is a set of highly information-based management software. If you want to fully apply SAP software, you must understand a lot of knowledge, IT knowledge and business management knowledge. Therefore, if you want SAP to serve the enterprise, to enhance the enterprise, it is necessary to carry out technical training vigorously, and the implementation of ERP must not be an optional tool. Therefore, it is necessary to train the company on the principles of ERP, train the principles and functions of ERP, why do you want to go to ERP, let the company have a full understanding, and also train the management so that leaders should pay enough attention to the role of ERP in the company and support the implementation of ERP and be able to lead the team to implement ERP effectively. Only when the leaders of the enterprise pay attention to it, the grassroots employees can pay attention to it. Therefore, ERP training

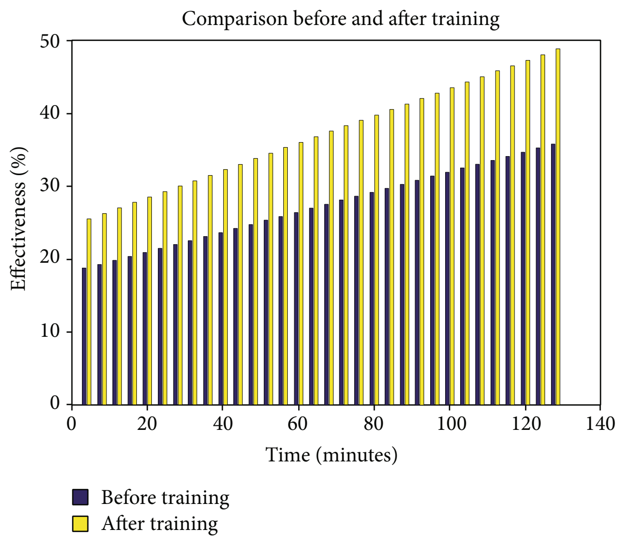

Figure 3: Comparison of employee work efficiency before and after training.

is very important in enterprises. Not only need to carry out theoretical training, but also to carry out operation and application training for grassroots employees, which can improve the efficiency of daily work. The comparison of the work efficiency of employees before and after training is shown in Figure 3.

During the project implementation process, the implementing party assisted the automobile company base to introduce advanced management concepts and refined the ideas through process design. After implementing the SAP ERP system, automobile manufacturing company A has realized the whole process of automation of the company's business process from sales order to order delivery, and the whole process can be carried out under the supervision and control of management personnel. This complete and lean management model has significantly improved the order fulfillment rate and timely delivery rate of automobile manufacturing company A. From the comparison before and after the launch of the SAP project, the above two indicators have increased by 1.5 times, the order fulfillment rate has increased from 30% to 45%, and the timely delivery rate has increased from 60% to 90%. The order situation of the automobile manufacturing company is shown in Figure 4.

Faced with the challenges of mixed-line production requiring timely and accurate distribution and reducing inventory, the SAP system realizes efficient coordination and information sharing of production, inventory, and procurement and flexibly supports JIT (Just-In-Time) Kanban, VMI supplier management inventory, etc. A variety of business models improve the efficiency of business processing and achieve the purpose of full logistics collaboration. Based on the status quo of basic management and information construction of an automobile company, the goal of this project is to establish a new core operating system for the base through the implementation of the SAP system and to lay a solid foundation for the development of the base business in City A. Due to the successful launch and smooth operation of the SAP ERP system, the overall informatization level of car manufacturing company A has been greatly improved, which has improved the communication efficiency between departments, headquarters, and branches and indirectly increased the overall operating costs of the group. After the SAP ERP system went live, the total turnover of automobile manufacturing company A increased from RMB 8.2 billion to RMB 12 billion in two years. The specific economic benefits are shown in Table 1.

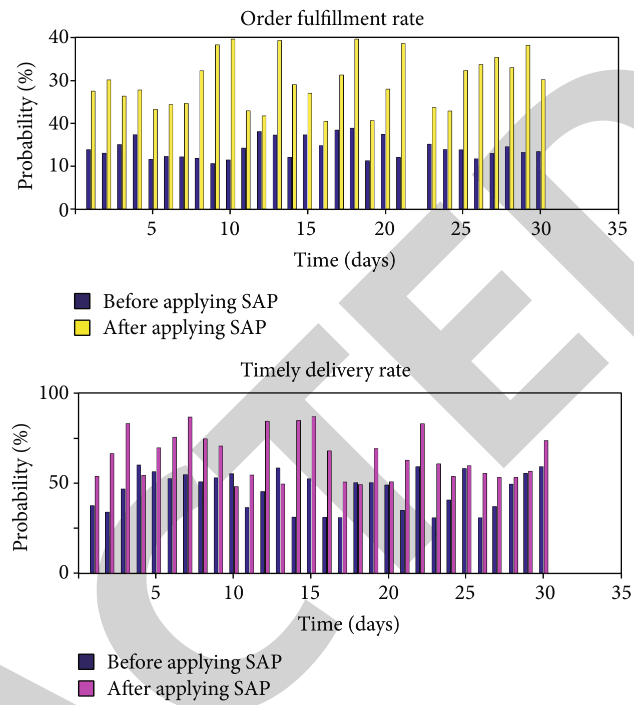

Figure 4: Order status of automobile manufacturing companies.

Table 1: Specific economic benefits.

Contrast content	Before implementation	After implementation
Sales revenue	RMB 8.2 billion	RMB 12 billion
Gross margin	24%	42%
Delivery achievement rate	60%	90%
Turnover of finished products	15 days	8 days
Finished product inventory accuracy rate	76%	98%
Days of accounts receivable	56 days	38 days
Bad debt rate	5%	2%
Proportion of expenses	10%	5%

In the process of implementing the SAP ERP system in car manufacturing company A, the manpower of key departments was organized, and the master data of each module was cleaned and converted, which ensured that the SAP project of car manufacturing company A can be successfully launched. SAP inventory is shown in Figure 5.

4.2. Company's Economic Benefits. With the continuous increase in the business scope of car manufacturing

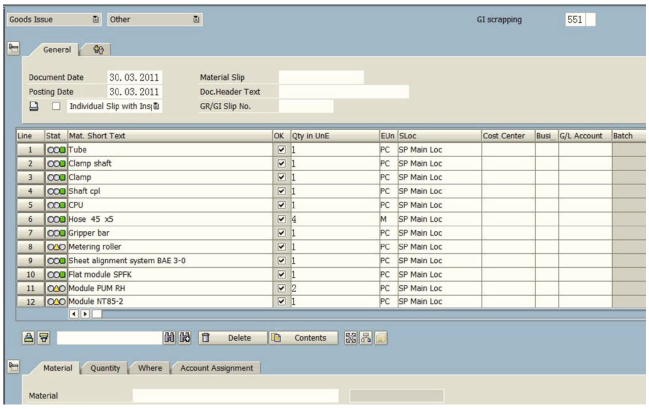

Figure 5: SAP inventory (http://alturl.com/or6i4).

Table 2: Specific economic benefits.

Compare content	Before implementation	After implementation
Average number of projects per month	30	10
Monthly sluggish material scrap	1.5 million	200,000
Daily production plan achievement rate	59%	89%
Weekly production plan achievement rate	56%	85%

company A and the continuous increase in product types, in the two years since the SAP ERP system was launched and then operated smoothly, the number of engineering changes proposed by the company each month has been greatly reduced, thus making group A overall quantity and amount of sluggish materials significantly reduced. The specific economic benefits are shown in Table 2.

In addition, the monthly production plan achievement rate increased from 50% to 82%. The on-time warehousing rate of production orders has increased from 60% to 88%. The one-time pass-through rate of products increased from 78% to 92%. The FQC pass rate has been increased from 90% to 95%. The product quality customer complaint rate dropped from 6% to 1%. The product quality is shown in Figure 6.

In the process of implementing the SAP ERP system, automobile manufacturing company A has configured an alarm function for the company's safety stock, the quantity and total amount of stock sluggish materials in the MM module. This time, through the implementation of the SAP system by car manufacturing company A, these information flows were integrated and unified, and the operation was carried out under a SAP platform. According to this platform, the overall operating efficiency of car manufacturing company A will be greatly improved, and corporate management costs will be reduced accordingly. The economic benefits of material management are shown in Table 3.

After implementing SAP system inventory improvement measures, company A's inventory management has been effectively improved, and the effect is significant. After implementing the SAP ERP system, automobile manufacturing company A uses the powerful data analysis and data intelligent processing functions of the SAP ERP system to present the financial, cost, and profit management analysis of automobile manufacturing company A in a good form.

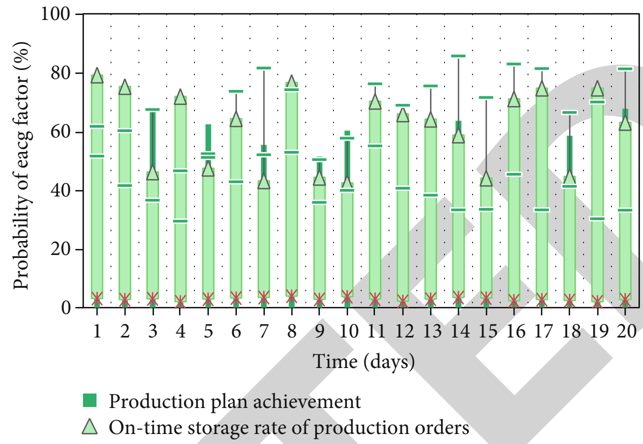

Figure 6: Product quality.

Table 3: Economic benefits of material management.

Contrast content	Before implementation	After implementation
Procurement delivery time achievement rate	40%	98%
Qualified rate of supplier incoming materials	86%	96%
PPAP submission achievement rate	Unable to count	95%
PPAP incoming material qualification rate	Unable to count	90%
Inventory accuracy	80%	95%
Finished product inventory turnover accuracy rate	86%	92%
Number of days around semifinished product	15 days	8 days

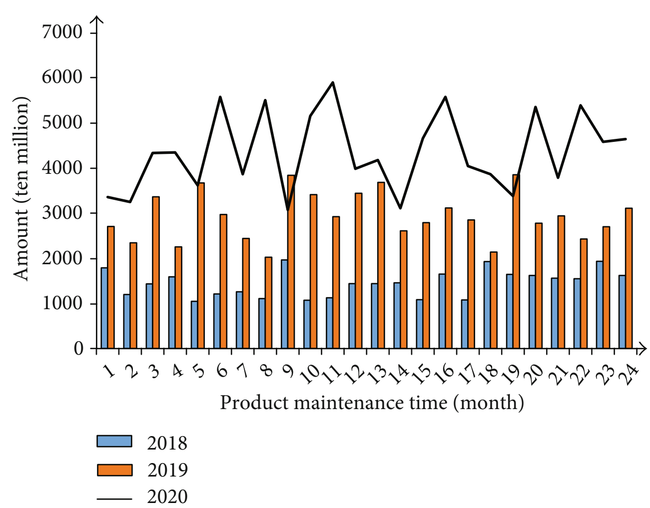

Figure 7: 2018-2020 financial situation of company A.

As a result, automobile manufacturing company A has made great progress in scientific, digital, and intelligent management of the enterprise. The financial situation of company A in 2018-2020 is shown in Figure 7.

5. Conclusion

This study mainly discusses the design and implementation of supply chain management system for automobile manufacturing enterprises based on SAP. This research integrates the existing information resources, takes SAP system as the enterprise's information platform, unifies the information platform into SAP system by integrating the existing information resources (financial system, logistics system, cost control system, production control system, etc.), avoids the information island phenomenon as far as possible, and finally realizes the integrated and unified enterprise information management, which is convenient for the rapid traceability of historical data, providing the best decision analysis method for managers. The project implementation of automobile company adopts independent minicomputer system (HP server), with SAPR/3 system as the core and C/S (customer/service) architecture, so as to gradually expand the system function in the future. The functions of the system include warehouse area management. The process of material information input can transfer material master data information with SAP system through blockchain technology. This study is helpful to provide guidance for the long-term development of enterprises. The establishment of the supply chain of this paper is centered on the vehicle manufacturer. Under this model, the position of parts manufacturers, dealers, and other members and how the thinking of enterprise informatization construction should be coordinated with the vehicle manufacturers also need to be further studied.

Data Availability

No data were used to support this study.

Disclosure

We confirm that the content of the manuscript has not been published or submitted for publication elsewhere.

Conflicts of Interest

There are no potential competing interests in our paper.

Authors' Contributions

All authors have seen the manuscript and approved to submit to your journal.

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