# Research on Supply Chain Optimization of Automobile Manufacturing Industry under the Background of Marketing Big Data

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**Keywords:** big data technology application, automobile industry, auto parts supply management, automobile vehicle manufacturing, automobile vehicle sales.

**Abstract:** With the rapid development of big data technology application, the impact of supply chain on the core competitiveness of enterprises has increased. This paper analyzes the problems existed in the auto parts supply management, automobile vehicle manufacturing process and automobile vehicle sales link, proposes the optimization strategy of the automobile manufacturing supply chain under the background of marketing big data, and adopts the optimization solution of establishing marketing big data platform, providing suggestions for the optimization of supply chain management in the automobile industry.

## 1. Introduction

The automobile manufacturing industry is one of the important mainstay industries for the development of the national economy, and it also represents the comprehensive level of national industrial manufacturing. Compared with traditional industrial countries, China's automobile manufacturing industry started late, and the overall level is very weak. There still existed problems such as the immature core technology, high logistics and other costs, much inventory waste, and slow response. With the competition of foreign companies for the growing domestic market, the automobile industry has become more complex and more uncertain, and the automobile manufacturing supply chain is facing with a more severe test. Due to the success of many world-renowned automakers in supply chain management practices, supply chain management has gradually become one of the means to enhance the core competitiveness of enterprises.

Information technology is the foundation of supply chain management, and big data is an important guarantee for information sharing and integration in the supply chain. The concept of big data has evolved and expanded based on the application and practice of big data in specific industries. Today, big data has the "5V" feature of "Variety", "Velocity", "Volume", "Veracity" and "Value-adding". [1] The main purpose of this paper is to apply the relevant marketing data of the automobile industry to propose the corresponding supply chain optimization strategy for the automobile manufacturing industry in order to minimize the intermediate cost of the supply chain, improve the circulation efficiency, and maximize profits.

## 2. Review of Domestic and Foreign Research

Big data has greatly promoted the development of the supply chain. The application of big data in the supply chain has been concerned by the academic community since 2012, but the research has not yet matured. [2] The research on the application of big data in the supply chain is mainly carried out from three perspectives. The first one is related research on the overall supply chain, the second one is research on the role of big data in all links of the supply chain, and the last one is research on practical application of data in the enterprise supply chain.

Regarding to research on big data analysis in the entire supply chain, focusing on automobile sales service supply chain network, Du measures the similarities of users based on the status quo of after-sales service and the problems existing in 4S stores, and uses intelligent network platform to

measure, analyze and integrate information, for instance, the user's basic data. At the same time, Du forecasts service items and service opportunities for customers' needs, and uses relevant real-time traffic and weather data to build an automotive after-sales service innovation model. [3] From shareholders' perspective, Gupta believes that the collaborative relationship between members of the supply chain can promote the implementation of circular economy and propose a model that emphasizes the active impact of big data analysis on achieving the goal of share stability. [4] Shirsh aims to form a theoretical model that explains the organizational goals of big data and predictive analysis for stable enterprise development, and proposes many guiding suggestions according to four assumptions. [5] In terms of sustainability, Zhao demonstrates a multi-objective optimization model for a green supply chain management solution and proposes three solutions to improve green supply chain management using big data analysis. [6]

In addition, big data in the supply chain process also plays an important role, and some foreign scholars have studied it. Based on the advancement in capacity and speed of technology and data collection systems over the past decade, Boone evaluates the impact of data surges on product forecasts and how to continually promote product forecasts, while also explores how these data can be used to gain insight into consumer behavior and the impact on organizational predictions. [7] Schlegel uses big data and predictive analytics to identify, assess, mitigate, and manage the risks of supply chain procurement. [8] Katchasuwanmanee develops a low-energy management system through big data-driven analysis of the relationship between internal and external data and optimized data flow. [9]

Since big data analysis has become a trend in enterprise supply chain management, domestic scholars focus on researching enterprise supply chain management. [10] Cheng Dong analyzes the influencing factors, for instance, the data type of big data, and the impact of big data on the operational efficiency of supply chain, which is used to help enterprises achieve effective supply chain decision-making. [11] Zhao Rui builds a big data intelligent supply chain system based on the impact of big data on all aspects of the supply chain, and proposes countermeasures and recommendations according to the obstacles to the development of the system. [12] Zhang Shiyu introduces the specific role of big data in sorting, distribution, and forecasting in enterprise supply chain management. [13]

In summary, foreign scholars focus on strategic decision-making, network design, agility and sustainability in the analysis of big data analysis in the entire supply chain, while their research on big data analysis in the supply chain process focuses on demand planning, procurement, production, inventory, logistics and distribution. However, domestic research on the relationship between big data and supply chain focuses on the impact of management in the supply chain of enterprises. This paper will study the status quo and problems and optimization strategies of auto parts supply management, automobile manufacturing process and vehicle sales links in the supply chain management systems under the background of marketing big data in order to promote the continuous improvement of the automobile manufacturing supply chain and improve supply chain efficiency and enhance the core competitiveness of automobile manufacturing enterprises.

## 3. Analysis of Problems Existing in Supply Chain Management of Automobile Manufacturing Industry

### 3.1 Low Degree of Automation in Auto Parts Supply Management

The auto parts supply chain is located upstream of the automobile manufacturing supply chain and is an important part of the automobile manufacturing supply chain. It is also the key to the benign operation of the supply chain and an important part that determines the supply chain capabilities of the auto manufacturing enterprises. A complete vehicle is made up of thousands of parts, and with the development of the automotive industry, there are more and more types of parts. However, only a small part of these components is self-manufactured by automobile manufacturing enterprises. Most of them are outsourced parts produced by widespread suppliers, and thus lead to

there being many factors affecting costs. Due to the low standardization of parts, it is easy to cause problems such as size, shape and specifications of parts and the quality of distribution is difficult to guarantee. Therefore, it is hard to coordinate parts supply chain management, and it is the hardest supply chain management of the automobile manufacturing industry. The mode of the auto parts supply chain is mainly composed of automobile raw material manufacturers, parts manufacturers and supply service providers surrounding automobile whole vehicle manufacturing enterprises. Due to the limited storage area of the assembly line and the timeliness of delivery, the intermediate warehouse is usually set up to complete the circulation of logistics, information flow and capital flow. However, a larger number of intermediate warehouses also increase the total cost of supply chain logistics. At the same time, due to the relatively weak automobile industry in China and the limitation of the infrastructure and management level of enterprises in the supply chain of the automobile manufacturing industry, the coordination ability of industrial resources in the parts supply chain is seriously insufficient. In addition, the contradiction between the demand and supply of auto parts is a particularly prominent problem. A series of problems such as how to improve the flexible connection efficiency of the production and sales links to ensure the benign operation of the inbound logistics, how to ensure the quality of the parts to achieve the quality of the whole vehicle manufacturers' products, how to integrate resources based on information platform, breaking a single island between management software and enhancing the practicability of management software, need to be solved. Generally speaking, in the face of an auto parts supply chain system with a complex supply structure and different management levels, the information flow data collection and maintenance is low in automation, lacks managing and tracking means, and thus relies on manpower, resulting in waste of human resources. The information flow is therefore incomplete, management and control are difficult to implement, and the asynchronous information flow and logistics make the operation waiting time long and labor productivity low, so it puts very high demands on supply chain management.

### 3.2 Prominent Contradiction between Supply and Demand in the Automobile Vehicle Manufacturing Process

The automobile vehicle manufacturing, which is the core of the automobile manufacturing supply chain, is located in the middle of the supply chain and belongs to the internal supply chain of the enterprise. Therefore, it is dominated and planned by automobile manufacturing enterprises. At the same time, automobile manufacturing enterprises are also information control centers for the supply chain. In this stage of the supply chain, the information flow specifically includes accepting and processing orders, compiling work plans, determining the identity of the body assembly, arranging the body assembly, feedback and control of accidental abnormal conditions, reordering, etc., while entity logistics specifically includes guiding the flow of the body in the production process, controlling the assembly sequence, guiding the on-time delivery of parts, realizing the production plan, and ensure the timely delivery of orders. A complete automobile vehicle manufacturing supply chain process includes mechanized production line logistics and simultaneous distribution parts flow of three major processes body welding, body painting and final assembly, and the goal of vehicle manufacturing supply chain management is to achieve high coordination of entity logistics and information flow. According to the correct guidance of the information flow and the orderly operation of the entity logistics, the automobile vehicle manufacturing is completed, aiming at realizing a flexible supply chain that can narrow the difference between the production plan and the actual production. Supply chain management in automobile vehicle manufacturing usually guides the execution and control of the plan in the form of an assembly sequence card that efficiently integrates logistics and information flow and ensures the synchronous coordination of parts and automobile manufacturing. Each assembly line has an assembly sequence card, and each car also has a unique manufacturing order. The manufacturing ordering problem is an inevitable problem in the manufacturing process, and the core of the manufacturing ordering problem is timely delivery, coordinated resource allocation and minimized cost through efficient manufacturing sequencing. Therefore, the assembly sequence card plays a big role in this process. Under the production

constraint condition of each process, the order in which the production process conforms to the assembly sequence cards can ensure effective production capacity and inventory control. At the same time, in the manufacturing process, due to quality problems, equipment failures, etc., the assembly sequence card can also help the manufacturing process to restore the predetermined sequence as early as possible. At present, there is a contradiction between supply and demand between long-term production planning and short-term demand for automobile manufacturing. However, the balanced manufacturing based on the market sales forecasting adaptation plan and the synchronous manufacturing based on the customer's order-oriented organization cannot solve the contradiction between supply and demand. In addition, a series of problems surrounding cost are present in the automobile vehicle manufacturing process. For example, in the actual manufacturing process, manufacturing companies cannot adjust to an average manufacturing tempo in time, resulting in additional inventory; safety stocks are based on reducing the cross-impact of adjacent equipment failures on the production line, resulting in a shutdown, but also increased inventory cost; in order to cope with the ever-changing market demand while utilizing the production capacity of the pipeline as much as possible, the automobile manufacturing enterprise adopts the multi-line mixed flow method, thereby reducing the cost per unit product and realizing the independence of the supply chain. However, with the delivery deadline, the optimal multi-line mixed flow combination may not be able to complete an order for a single model on time. Therefore, automobile vehicle manufacturing management relies on the high management level and high degree of specialization of automobile manufacturing enterprises.

### 3.3 Inefficient and Costly in the Automobile Vehicle Sales Link

The automobile vehicle sales are directly oriented to the end user. It is located downstream of the supply chain management of the automobile manufacturing industry and is a customer-oriented link directly around the vehicle sales service. Automobile vehicle sales refer to the process from the assembly line to the storage, and then to the general warehouse or local warehouse through the transportation of waterways, railways and highways, and finally to the sales outlets through the city distribution to the final customer. The whole process of vehicle sales includes the operation and management activities of entity logistics and transportation and the data exchange and document delivery of information flow in operation and management activities. The goal of automobile vehicle sales management is to create value for time and space based on customer satisfaction, and to add value to automotive products through personalized services, which are characterized by the rationalization of the sales network and are measured through cost control, delivery deadlines and quality of service. China's automobile manufacturing industry has long adopted a self-production and self-marketing approach, using the company's self-dominated logistics operation mode. However, this mode is not only costly, but also inefficient in logistics, and unable to form a competitive advantage. Under this background, the external collaborative operation mode, which is an integrated mode of operation, is currently not competitive in terms of scale effect, but it has become a trend. The management contract form conforms to the needs of most of China's automobile manufacturing industry, and some logistics business is outsourced through contract form, and still has management and control capabilities for the logistics system. Therefore, third-party logistics service providers and even fourth-party logistics service providers will become the choice of auto manufacturing companies. In addition, value-added services such as distribution processing of third-party logistics services have huge room for improvement. Problems concerned with the value creation of space and time, such as how to effectively integrate orders to control the execution time of orders, how to integrate the transformation between various modes of transportation to form an efficient transshipment hub, how to use the scale effect of transportation to reduce the cost of automobile vehicle sales logistics, etc., also need to be solved through the information platform.

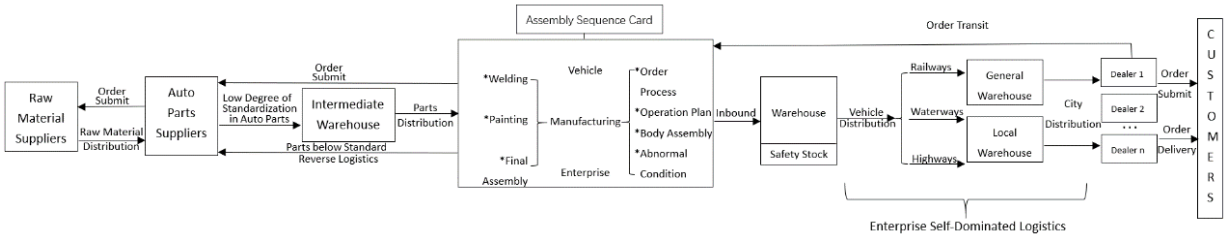


Figure 1. The Present Situation of Automobile Manufacturing Supply Chain (Before Optimization)

## 4. Optimization of Automobile Manufacturing Supply Chain under the Background of Marketing Big Data

### 4.1 Establish a Platform-Based Supply Chain Model and Build a Marketing Big Data Platform

The operation costs of traditional supply chains include ordering costs, delay costs, out-of-stock costs, inventory costs, transaction costs, procurement costs, and total fixed costs (including fixed ordering costs, fixed production costs, etc.), while operation costs of platform-based supply chains include ordering costs, delay costs, out-of-stock costs, transaction costs, procurement costs, and total fixed costs. According to the characteristics of traditional supply chain and platform-based supply chain in operation costs, this paper compares the operation costs of the two between the traditional supply chain and the platform-based supply chain. The symbolic description of the model is as follows:

$C_1$, $C_2$ Operation costs of traditional suppliers and platform-based suppliers
$q_1$, $q_2$ Order quantity of production material a and production material b
$x_1$, $x_2$ Unit ordering cost of production material a and production material b
y Unit time delay cost of manufacturing company
$t_1$, $t_2$ Delay time of supplier A and supplier B
$S_1$, $S_2$ Out-of-stock costs of supplier A and Supplier B
$n_1$, $n_2$ Production quantity of supplier A and supplier B
D Market demand of manufacturing company
$c_1$, $c_2$ Unit holding cost of production material a and production material b
$p_1$, $p_2$ Unit price of production material a and production material b
$F_1$, $F_2$ Total fixed cost of supplier A and supplier B

The models of operation costs of traditional supply chains and platform-based supply chains are as follow:

$$C_1=(q_1\cdot x_1+q_2\cdot x_2)+y\cdot\max(t_1,t_2)+(S_1+S_2)+(t_1c_1n_1+t_2c_2n_2)+c_1[n_1-\min(n_1,n_2,D)]+c_2[n_2-\min(n_1,n_2,D)]+D(p_1+p_2)+(F_1+F_2);$$

$$C_2=(q_1\cdot x_1+q_2\cdot x_2)+y\cdot\max(t_1,t_2)+(S_1+S_2)+c_1[D-\min(n_1,n_2)]+c_2[D-\min(n_1,n_2)]+D(p_1+p_2)+(F_1+F_2);$$

According to the formula above,

$\because$

$$t_1c_1n_1+t_2c_2n_2+c_1[n_1-\min(n_1,n_2,D)]+c_2[n_2-\min(n_1,n_2,D)] > c_1[D-\min(n_1,n_2)]+c_2[D-\min(n_1,n_2)]$$

$\therefore$

$$C_1>C_2$$

It is concluded that the traditional supply chain operation costs are greater than the platform-based supply chain operation costs. Therefore, automobile vehicle manufacturers can establish a platform-based supply chain to take advantage of the operational advantages of the platform-based supply chain.

Under the background of marketing big data, automobile vehicle manufacturers rely on marketing big data to establish an information sharing platform, with automobile vehicle manufacturing companies as the core, to build a marketing big data platform of raw material producers, component manufacturers, enterprise core logistics, third-party logistics, sales outlets and the final customer's information integration. Through the marketing big data platform throughout the entire automobile manufacturing supply chain, automobile vehicle manufacturers and raw material manufacturers, parts manufacturers will have a collaborative goal due to information sharing, according to the collaborative goal, automobile vehicle manufacturers and raw material manufacturers, parts manufacturers will ease the competitive relationship and avoid unnecessary inventory costs and logistics costs due to information blockage. At the same time, automobile vehicle manufacturers use the marketing big data platform to help forecast demand. Through accurate demand forecasting, automobile vehicle manufacturers alleviate the pressure on the whole vehicle sales link, and achieve the collaborative goal of automobile vehicle manufacturing enterprises and salesmen. In the logistics process, the cooperation between automobile vehicle manufacturers and third-party logistics includes not only the cooperation in entity logistics, but also the sharing of information flow. The automobile vehicle manufacturing enterprises use third-party logistics to track the logistics process and provide demand forecast for third-party logistics, thereby reducing inventory costs. Therefore, automobile vehicle manufacturers should establish a platform-based supply chain and build a marketing big data platform.

### 4.2 Optimization of Parts Supply Management under the Background of Marketing Big Data

As an important part of determining the supply chain capacity of an enterprise, the efficiency of parts supply management determines the efficiency of the supply chain of the automobile manufacturing industry. Due to the complexity of the components themselves, the low degree of standardization, and the fact that most of the components are outsourced, the efficiency of the components depends on the coordination of the information platform. Based on the marketing big data platform, each raw material supplier shares the raw material information with the component suppliers, and each parts supplier submits the order to the raw material manufacturer through the order of the automobile manufacturing enterprise and the raw material information. At the same time, when the parts are about to be put into production, each parts supplier uploads the information of the differently standardized parts to the marketing big data platform of the manufacturing enterprise through the internal information collection tool. Through the marketing big data platform, it integrates information to screen out the parts products conforming to the standard of automobile vehicle manufacturing and purchases the corresponding parts from the corresponding parts suppliers, and gives feedback to the parts suppliers that do not meet the parts standards in order to improve the efficiency and product quality of the parts suppliers. Therefore, by marketing the big data platform, the information flow of parts is prior to logistics, thereby improving the efficiency and effectiveness of the automobile vehicle manufacturing enterprises in the procurement process, and reducing the reverse logistics costs of some suppliers that do not meet the parts standards of the automobile vehicle manufacturing enterprises. In addition, the establishment of the marketing big data platform transforms the inventory management model of the automobile vehicle manufacturing enterprise into the VMI model, and the parts suppliers determine the supply time of the parts, while the vehicle manufacturing enterprises only need to supervise and control the products shipping process. Based on this model, automobile vehicle manufacturers can reduce additional human and financial resources to monitor and manage components. The marketing big data platform can guide automobile raw material manufacturers and parts manufacturers to provide parts to automobile vehicle manufacturers based on demand analysis and forecasting. On this basis, Processes of procurement, inventory, and transportation between parts production and automobile vehicle manufacturing can be greatly improved, for example, setting the appropriate parts inventory capacity, which reduces the inventory cost of the intermediate warehouse, and guides the accuracy and timeliness of parts procurement at the same time. Because China's auto industry is relatively weak, the marketing big data platform can effectively make up for the shortage of infrastructure and

management level of the automobile manufacturing supply chain, and can also coordinate logistics, use information flow to collect and maintain automated equipment, such as RFID and other Internet of Things technologies which acquire information and tracking logistics, while reducing the cost of human resources, improving the efficiency of information flow management and tracking, optimizing the integrity of information flow and synchronization with logistics. Therefore, it can achieve the effect of flexibly connecting production with sales, guaranteeing the quality of parts, and integrating resources.

### 4.3 Optimization of Automobile Vehicle Manufacturing Process under the Background of Marketing Big Data

Faced with the contradiction between supply and demand in the automobile vehicle manufacturing process, automobile vehicle manufacturers can rationally use marketing big data to ease the contradiction between supply and demand. Due to the limited capacity of current marketing data for forecasting market trends, the accuracy of demand forecasting in the market is often insufficient, resulting in slow response. However, when planning production and manufacturing, high-accuracy demand forecasting is often required to achieve supply and demand balance. The automobile vehicle manufacturing process is the internal supply chain of the automobile manufacturing, and it is responsible for building the marketing big data platform to control the information flow of the automobile manufacturing supply chain. The marketing big data platform built by the automobile vehicle manufacturing enterprise can use the marketing big data to integrate, analyze, calculate and process the previous sales data, and predict the short-term demand and long-term demand in the future through massive data, and then according to the production capacity of the enterprises, the enterprises carry out pre-production through the predicted data, accept and process of orders based on the marketing big data platform, and can set a reasonable postponement for the order, which means before the actual order is sent to the automobile vehicle manufacturing enterprise, the enterprise can process and assembly the automobile vehicle with the same basic parts to the same level where the postponement is set. When the actual order is sent to the vehicle manufacturing enterprise, the vehicle at the same level can be personalized. At the same time, according to the degree of coincidence between short-term demand and actual demand, the long-term demand is corrected according to the deviation from the predicted value to the actual value. By correcting the calculation method to improve the forecasting ability of big data, the prediction effect of big data is exerted, the delivery time from the order to the whole vehicle manufacturing is greatly shortened, and the efficiency of the manufacturing to sales process is improved. Based on market sales forecasts and order postponement, the marketing big data platform integrates the advantages of balanced manufacturing and simultaneous manufacturing to narrow the contradiction between supply and demand. In the manufacturing process, vehicle manufacturers use marketing big data, according to the situation of body welding, painting and final assembly, aiming at the synchronous coordination of production line logistics and distribution parts flow, and optimization of planning the operation. Based on using RFID to identify the body assembly, the assembly is performed according to the operation plan of the marketing big data platform. In addition, when an abnormal situation occurs, feedback is performed by the abnormal data, and the calculation capability of the big data is utilized to quickly assembly reordering to control the abnormal condition. Due to the decisive role of the assembly sequence card in the manufacturing sequencing process, the vehicle manufacturing enterprise can make the marketing big data platform cooperate with the assembly sequence card. The marketing big data platform can optimize the assembly sequence card through data feedback, and can also track the basis of entity logistics in the assembly process in accordance with the assembly sequence card, thereby enhancing the core competitiveness of manufacturing companies. Taking into account the current status of inventory, the marketing big data platform can guide vehicle manufacturers to adjust to the average manufacturing tempo in time, reducing additional inventory; in addition, in most cases, safety stocks do not play their roles owing to inaccurate forecasts, but marketing big data makes up for the accuracy of the forecast. Therefore, safety stocks work and turn costs into benefits. In addition, the multi-line mixed flow of vehicle manufacturers has an

unreasonable setting. Marketing big data platform can rearrange a reasonable multi-line mixed flow method. Based on the limitation of delivery deadlines and the utilization of predicted or existing demand data. It can be seen that the marketing big data platform can effectively improve the management level and management specialization degree of automobile manufacturing enterprises.

### 4.4 Optimization of Automobile Vehicle Sales under the Background of Marketing Big Data

Automobile vehicle sales are the link to obtain final profit and involve in customer service. It can also exert supply chain efficiency by improving logistics efficiency and reducing logistics costs. Through the integration of marketing big data platform, the vehicle manufacturing enterprise evaluates the location setting of each sales outlet based on the marketing big data information of dealers and customers. Under the guidance of the marketing big data platform, with the goal of reducing costs, timely delivery, and improving customer service, the distribution methods and distribution routes are rearranged from the assembly line to the storage process and between sales outlets. At the same time, the marketing big data platform can also guide the inventory management and warehousing management of the automobile vehicle sales, the cross-docking in the automobile vehicle sales process, reducing waste in inventory management, in addition, and the storage of reasonable limits, reducing storage costs as much as possible under the premise of safe storage in the warehouse. With regard to creating time utility, vehicle manufacturers can use the marketing big data platform to ensure the integrity and accuracy of orders, and to screen the credits of customers and salesmen to ensure the quality of order execution, thereby reducing the time required for order execution. Due to the high transportation costs of vehicle sales, it is necessary to rely on accurate order forecasting to avoid the high cost of vehicle sales logistics. Under the guidance of the marketing big data platform, the customer's demand is accurately predicted to avoid the sales channel being blocked due to the deviation of customer demand forecasts, thus reducing the scale of logistics and transportation in order to reduce risks. The marketing big data platform can increase the scale of the physical transportation process in order to reduce the logistics cost of the unit automobile product while ensuring the low risks. There are many vehicle manufacturers that lack the awareness of the improvement of the logistics operation mode. The marketing big data platform can integrate the self-dominated logistics cost of the enterprise with the logistics cost of the third party and the fourth party logistics the enterprise outsourcing, and considering the importance issues of logistics to the enterprise, such as whether the logistics is the core logistics of the enterprise, and comprehensively analyze so that some secondary logistics and the other logistics that do not affect the core competitiveness of the enterprise are entrusted to third-party and fourth-party logistics, which can reduce logistics costs and the logistics risk of the enterprise.

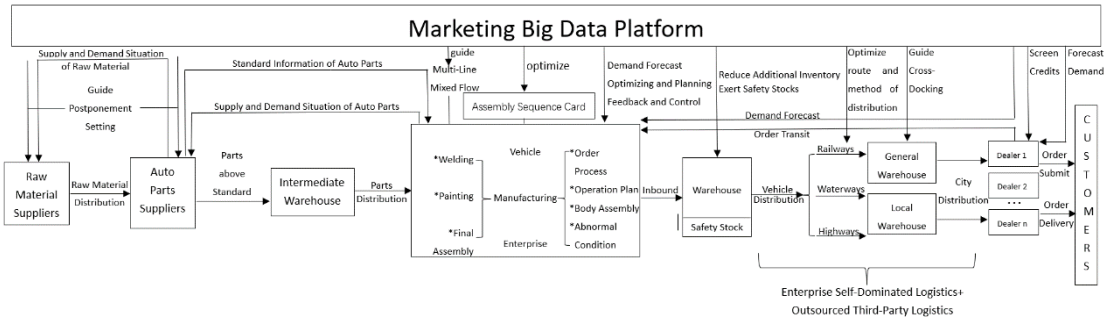


Figure 2. The Marketing Big Data Platform-Based Automobile Manufacturing Supply Chain (After Optimization)

## 5. Summary

Nowadays, China's automobile manufacturing industry still faces many problems. With the improvement of the strategic and importance of supply chain in enterprises and the rapid development of the application of big data technology, this paper aims at the research on supply

chain optimization of automobile manufacturing under the background of marketing big data. This paper divides the automobile manufacturing supply chain into auto parts supply management, automobile vehicle manufacturing process and automobile vehicle sales link, explores the problems existing in each link of the automobile manufacturing supply chain, and proposes that low degree of automation in auto parts supply management, prominent contradiction between supply and demand in the automobile vehicle manufacturing process and inefficient and costly in the vehicle sales link. According to the problems in the supply chain of the automobile manufacturing industry, this paper adopts the optimization solution of building the marketing big data platform, and presents the optimization flow chart to clarify the optimization method. This paper provides an optimization method for the automobile manufacturing supply chain through the optimization research on the automobile manufacturing supply chain under the background of marketing big data, takes advantage of the platform-based supply chain and optimizes the supply chain management of the automobile manufacturing industry to improve the automobile manufacturing industry. At the same time, this paper takes the automobile manufacturing industry as an example to provide a supply chain optimization strategy for the entire manufacturing industry, promote the supply chain optimization of the entire manufacturing industry, improve the level of industrial manufacturing, and promote the development of the national economy.

## References


[1] Addo-tenko rang R, Helo P T. Big data applications in operations/supply-chain management: a literature review [J]. Computers & Industrial Engineering, 2016, 101(5): 528- 543.

[2] LU Shan, CHEN Yu-bin. Review of Researches on Analysis and Application of Big Data in Supply Chain [J]. Journal of Business Economics, 2018 (9): 27-35.

[3] Du Yan. Research on optimization of automobile after-sale service supply chain network eased on big data processing [J]. RISTI (Revista Iberica de Sistemas e Tecnologias de Informacao). Nov 15, 2016, Issue E11, p106, 11 p.

[4] Gupta Shivam, Chen Haozhe, Hazen Benjamin T., Kaur Sarabjot, Santibañez Gonzalez Ernesto D. R. Circular economy and big data analytics: A stakeholder perspective[J]. Technological Forecasting & Social Change, January 2017.

[5] Shirish Jeble, Rameshwar Dubey, Stephen J. Childe, Thanos Papadopoulos, David Roubaud, Anand Prakash. Impact of big data and predictive analytics capability on supply chain sustainability [J]. The International Journal of Logistics Management, 2018, Vol. 29, Issue 2, pp. 513-538.

[6] Zhao Rui, Liu Yiyun, Zhang Ning, ∗Huang Tao. An optimization model for green supply chain management by using a big data analytic approach. Journal of Cleaner Production, 20 January 2017 142 Part 2:1085-1097.

[7] Boone Tonya, Ganeshan Ram, Jain Aditya, Sanders Nada R. Forecasting sales in the supply chain: Consumer analytics in the big data era. International Journal of Forecasting, January-March 2019 35(1):170-180.

[8] Schlegel G L. Utilizing big data and predictive analytics to manage supply chain risk [J]. The Journal of Business Forecasting, 2014, 33 (4): 11-17.

[9] Katchasuwanmanee K, Bateman R, Cheng K. Development of the energy-smart production management system (e-Pro Man): a big data driven approach, analysis and optimization [J]. Proceedings of the Institution of Mechanical Engineers, 2016, 230(5): 1937-1945.

[10] Lu Shan, Chen Yubin. Review of Researches on Analysis and Application of Big Data in Supply Chain [J]. Journal of Business Economics, 2018(9): 27-35.

[11] Cheng Dong, Chen Sijie. Big Data Application in Supply Chain Management [J]. Modern Management Science, 2017(8): 9-11.

[12] Zhao Rui. Research on the Model of Commercial Big Data Technology Intelligent Supply Chain in Industry 4.0 Era [J]. Journal of Commercial Economics, 2018(6):30-33.

[13] Zhang Shiyu. The Application of Big Data in the Enterprise Supply Chain [J]. Computer Products and Circulation, 2019 (4):113.