Research on the Practice of Railway Transportation Supply Chain Management for GAC Trumpchi Automobiles to Urumqi

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Abstract: This paper takes the transportation business of GAC Trumpchi automobiles from Guangzhou to Urumqi Sanping Station by railway and then distributed to Kashgar, Yili and other regions as the research object. Focusing on the core work links such as vehicle identification number (VIN) management, system information entry, real-time location update and terminal vehicle delivery verification, it analyzes the operation process and management characteristics of the automobile transportation supply chain, points out the advantages and potential problems in the current process, and puts forward optimization suggestions. The research aims to provide practical reference for the supply chain management of long-distance automobile railway transportation and regional distribution, and help improve the efficiency and service quality of automobile logistics and transportation.This paper takes the transportation business of GAC Trumpchi automobiles from Guangzhou to Urumqi Sanping Station by railway and then distributed to Kashgar, Yili and other regions as the research object. Focusing on the core work links such as vehicle identification number (VIN) management, system information entry, real-time location update and terminal vehicle delivery verification, it analyzes the operation process and management characteristics of the automobile transportation supply chain, points out the advantages and potential problems in the current process, and puts forward optimization suggestions. The research aims to provide practical reference for the supply chain management of long-distance automobile railway transportation and regional distribution, and help improve the efficiency and service quality of automobile logistics and transportation.

Keywords: GAC Trumpchi; Automobile Logistics; Railway Transportation; Supply Chain Management; Location Tracking; Vehicle Delivery Verification

1 Introduction

1.1 Research Background

With the continuous deepening of the regional layout of China's automobile industry, the demand for cross-regional transportation of automobiles from production areas to consumer markets has been growing steadily. Railway transportation has become one of the core modes of medium and long-distance automobile transportation due to its advantages of large transportation capacity, low cost and strong stability[1]. As a representative of independent brands, GAC Trumpchi faces problems such as long transportation distance, wide distribution area, and difficult vehicle condition and location control in the transportation of its products to remote areas in Northwest China such as Xinjiang. As a logistics hub in Northwest China, Urumqi Sanping Station has become a key node for GAC Trumpchi's automobile railway transportation. The subsequent distribution to Kashgar, Yili and other regions and the whole-process control

directly affect the delivery efficiency and customer satisfaction.

1.2 Research Significance

1. Practical Significance: By sorting out the whole-process operation mode of the transportation supply chain and refining practical experience such as VIN traceability and dual-time location update, it provides a reference scheme for automobile enterprises' cross-regional transportation management.

2. Theoretical Significance: It enriches the empirical research on "railway transportation + regional distribution" in automobile logistics and makes up for the deficiency of current research combining terminal vehicle delivery verification and real-time information control[2].

1.3 Research Content and Methods

By sorting out the whole transportation process of GAC Trumpchi automobiles from Guangzhou to Xinjiang, this paper adopts the case study method, focusing on three core links: information entry, location update and vehicle delivery verification. Combined with the actual work scenarios, it summarizes the advantages of the process and puts forward improvement directions.

2 Related Theories and Industry Status Quo

2.1 Core Theoretical Basis

1. Automobile Supply Chain Management Theory: It emphasizes the coordinated operation of the whole chain of automobiles from production to delivery, covering the overall optimization of transportation, warehousing, information flow and other links to achieve cost reduction and efficiency improvement[3].

2. Logistics Visualization Theory: Through the information system to record key cargo information and location data, it realizes the traceability and monitoring of the logistics process, which is the core support for ensuring the stability of long-distance logistics[4].

2.2 Status Quo of the Automobile Railway Transportation Industry

At present, most domestic automobile railway transportation adopts special vehicle transport vehicles and realizes batch transshipment relying on railway freight stations[5]. However, there are still shortcomings in terminal distribution, information synchronization and vehicle condition verification. Some enterprises have problems such as delayed information entry, untimely location update and irregular vehicle delivery process, which are likely to lead to transportation delays, vehicle condition disputes and other situations[6]. The VIN binding system entry and dual-time location update mode adopted by GAC Trumpchi provides a differentiated management idea for the industry[7].

3 Operation Process of GAC Trumpchi's Automobile Railway Transportation Supply Chain to Xinjiang

3.1 Preliminary Railway Transportation and Node Connection

GAC Trumpchi automobiles are batch loaded into special railway transport vehicles from the Guangzhou production base and transported to Urumqi Sanping Station through the railway trunk line. The core of this link lies in the coordination between the railway transportation plan and the automobile production plan to ensure that the vehicle batches match the transportation space and guarantee the transportation time efficiency. After arriving at Sanping Station, the staff first complete the manual

verification and recording of the VIN of each vehicle. As the unique identifier of the vehicle, the VIN becomes the core basis for the subsequent whole-process management.

3.2 Core Information Entry and System Control

The staff enter the recorded VIN into the exclusive logistics management system, which synchronously retrieves the complete data of the vehicle's production information and configuration parameters, realizing the refined management of "one vehicle, one number, one file". This system provides the information basis for subsequent location tracking and vehicle delivery verification, and solves the industry pain point of chaotic vehicle information during long-distance transportation[3].

3.3 Regional Distribution and Real-Time Location Update

1. Distribution Planning: Classify vehicles based on destinations, plan transportation routes to Kashgar, Yili and other regions, and coordinate special logistics vehicles to complete the transshipment from Sanping Station to various regions.

2. Location Update Mechanism: Implement the real-time location update system twice a day in the morning and noon. The staff upload the vehicle transshipment track through the logistics system to ensure that the dispatch center and customers can timely grasp the vehicle dynamics and avoid the risk of loss of contact during transportation[4].

3.4 Terminal Vehicle Delivery Process and Verification Closed Loop

1. Vehicle Condition Inspection: After the vehicle arrives at the designated destination, the staff first check whether there are collisions on the vehicle appearance and whether the interior is intact, so as to eliminate damage problems during transportation[6].

2. Handover Confirmation: After the vehicle receiver issues a receipt, the staff complete the vehicle delivery confirmation operation in the system, forming a closed-loop process of "transportation - tracking - delivery" and ensuring clear rights and responsibilities in the vehicle delivery link[7].

3. Advantages and Potential Problems of GAC Trumpchi's Automobile Transportation Supply Chain

4 Advantages and Potential Problems of GAC Trumpchi’s Automobile Transportation Supply Chain

4.1 Process Advantages

1. Strong Traceability: The binding of VIN and the system realizes the whole-process traceability of vehicles, providing an accurate basis for problem investigation[3].

2. Information Transparency: The dual-time location update mechanism ensures the real-time performance of transportation information and improves the controllability of the supply chain[4].

3. Controllable Risks: The vehicle condition verification and receipt confirmation process during vehicle delivery effectively reduce the risk of vehicle damage disputes and delivery risks[6].

4.2 Potential Problems

1. High Dependence on Manpower: Both VIN entry and vehicle condition inspection rely on manual operations, which have the risk of human errors such as entry mistakes and inspection omissions[5].

2. Need to Improve Distribution Efficiency: The road conditions in Kashgar, Yili and other regions are

complex, and there are situations of untimely dispatch of transshipment vehicles on some routes, which affect the delivery cycle[8].

3. Insufficient System Synergy: The information between the logistics system and the vehicle receiver is not fully connected. The vehicle receiver needs to issue a receipt offline, and then the staff enter it online, resulting in process delays[7].

5 Optimization Suggestions for GAC Trumpchi's Automobile Transportation Supply Chain

5.1 Introduce Intelligent Technology to Reduce Manpower Dependence

Introduce code scanning equipment at Sanping Station to realize automatic scanning and entry of VIN, reducing manual entry errors; adopt AI visual inspection equipment to assist vehicle condition inspection, and quickly check appearance damage through image recognition technology to improve verification efficiency and accuracy[5].

5.2 Optimize the Regional Distribution and Dispatch System

Establish long-term cooperation with local logistics enterprises in Xinjiang, reserve transshipment vehicles in advance according to the order volume of each region; use big data to analyze historical transportation data, optimize transportation routes to Kashgar, Yili and other regions, avoid congested sections, and shorten the distribution time[8].

5.3 Promote the Synergistic Upgrade of Information Systems

Upgrade the logistics management system, add the online confirmation function for vehicle receivers. Vehicle receivers can upload receipt photos or directly sign electronically through the system to realize real-time synchronization of vehicle delivery information, reduce process delays and improve synergy efficiency[7].

6 Conclusion and Prospect

6.1 Research Conclusion

GAC Trumpchi's railway transportation supply chain from Guangzhou to Xinjiang has built a relatively perfect cross-regional transportation management mode through measures such as VIN binding system, dual-time location update and vehicle delivery verification closed loop[3]. The core advantage of this mode is to realize the whole-process controllability of transportation information and effective control of delivery risks, providing a practical model for long-distance automobile logistics[4]. At the same time, the problems such as manpower dependence and distribution dispatch in the process need to be gradually solved through technological upgrading and system optimization[5].

6.2 Future Prospect

With the development of intelligent logistics, in the future, the Beidou positioning system can be further introduced to realize real-time automatic upload of vehicle positions, and blockchain technology can be combined to ensure the immutability of vehicle delivery information; at the same time, expand the system functions to realize information linkage with GAC Trumpchi's production end and Xinjiang regional sales end, and build a more efficient whole-chain collaborative supply chain system[6].

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