

Retail Supply Chain Systems Analysis: A Case of Walmart

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Abstract: Walmart is one of the largest retailers in the world, and its supply chain system is affected. Through the analysis of Walmart's business and technology, this paper discusses the reasons for Walmart's success. The success of Walmart's supply chain system must be connected to its efficient logistics system, advanced information technology, and close cooperation. Analyzing Walmart's information-based logistics supply chain relationships highlights the importance of data sharing, automation, and optimization in improving operational efficiency, customer experience, cost reduction, brand management, and employee productivity. To improve competitiveness and meet customer needs, this study provides insights for local retailers in China. The study concludes with a summary of the research findings. The study concludes by summarizing the research findings, discussing its limitations, and suggesting future research directions.

Keywords: management information system, Walmart, supply chain system, SWOT

1. Introduction

As a leader in the global retail industry, Walmart has always been in the top three of the world's top 500 companies and is the world's largest retail department store today. With the support of information technology, Walmart can carry out global operations with the lowest cost, the best quality service, and the fastest management response [1].

Walmart's information management system is worthy of people's research and exploration in many aspects. This article analyzes Walmart's strategy and the external environment from a business perspective through the SWOT method, analyzes its supply chain management system from a technical level, provides experience for local retail enterprises in China from different perspectives, helps enterprises provide better products and services for customers, and improves enterprise competitiveness to meet customer needs better and achieve company goals.

This study is organized as follows: The first part is the introduction, which introduces the background and purpose of the research. The second part is the literature review, which mainly introduces existing research findings and model methods used in the study. The third part is Walmart's business strategy analysis. The fourth part mainly analyzes Walmart's information-based logistics supply chain relationships. The final part mainly summarizes the research results, discusses the study's limitations, and offers prospects for future research.

2. Literature Review

The definition of the supply chain was proposed by the American Supplier Institute in 1996 as all efforts involved in producing and delivering final products, including those from suppliers to customers [2]. It emphasizes that supply chain management is a cross-enterprise, cross-functional, and cross-departmental activity.

Walmart's supply chain information management uses information technology as the foundation and tool, applying it to every aspect of supply chain management to maximize efficiency at each stage. In this process, Walmart is continuously optimizing its supply chain. Walmart has used many management information technologies to build a powerful supply chain information management system [3].

SWOT analysis is a planning strategy to assess an organization's strategic position [4]. The empirical basis of a SWOT analysis emerged in 1952 in Lockheed's Corporate Development Planning Department. This approach was later used in large companies worldwide, mainly for corporate aim setting regarding strengths, weaknesses, opportunities, and threats [5]. In China, the SWOT model has been widely used in the strategic planning of enterprises.

Walmart's management information system has strong international system support. A typical computer system connects the company headquarters to all its global branches and suppliers [6]. They use the same replenishment system, EDI barcode, inventory management, and cash register systems. Applying these information systems allows all parties involved with Walmart to quickly obtain product information and observe trends in sales volume, inventory levels, related ordering information, etc. Data sharing improves the efficiency of various business modules and functions, thereby enhancing Walmart's strategic decision-making and cooperation capabilities.

3. Strategic Analysis

3.1. SWOT Analysis

3.1.1. Strength

Walmart is a renowned retail brand recognized for its wide range of goods, value for money, and one-stop shopping. The company boasts of a powerful logistics system supported by its subsidiary, McLean Limited Liability Company, a delivery service provider. Additionally, Walmart has a strong capital system, evidenced by its significant sales growth in recent years and global expansion, including the acquisition of the UK-based retailer ASDA. Walmart also has a mature human resource management system in place.

3.1.2. Weakness

Supplier resources are the third resource of various production factors of commercial enterprises that are no less than capital and management. For global suppliers, Walmart has always been strong on price. The low price policy is always the business policy of Walmart. However, all the pressure is placed on the suppliers. In that case, it will inevitably cause tension in the relationship with them, and the suppliers will respond with low-quality products, further affecting the sales performance of Walmart products. Walmart has moved a significant portion of its production operations to China over the past few decades, putting them at risk if one of its markets shrinks severely.

3.1.3. Opportunity

Walmart operates 2,133 Walmart stores, 469 Sam's Club stores, and 248 Walmart shopping malls in 14 countries worldwide [7]. Expanding into markets can bring new customers and market share to

the company. Walmart can leverage its online sales platform to expand its business further and use new technologies, such as artificial intelligence, to enhance the customer experience.

3.1.4. Threat

The U.S. retail industry is highly competitive, and major retailers have set up purchasing centers in China, so Walmart's low price advantage is vulnerable to challenges. As a giant retailer, Walmart is targeted by many companies, resulting in the face of more and more competitors. Only by maintaining innovation can it prevent it from being surpassed.

3.2. External Analysis

3.2.1. Economy

China's economy has developed rapidly, its overall economy has maintained rapid development, and its comprehensive national strength has increased significantly. In 2022, China's GDP exceeded the \$18 trillion mark for the first time, and its per capita GDP reached \$127 million. The increase in personal income will increase the per capita disposable income, increase the potential of consumers, and enhance the purchasing power of consumers. Walmart China's net sales rose 13.5%, and comparable sales rose 13.3% in the fourth quarter. Net e-commerce sales, which accounted for 48% of Walmart's total net sales in China in the fourth quarter, grew at 70%.

3.2.2. Technology

The development of computer technology has provided technical support for the retail industry. Walmart has the largest private satellite communication system in the United States and later established a computer and satellite interactive communication system. This ensures information sharing between the company's internal distribution centers and retail stores. Walmart's information system can directly transmit scanned data to the company's headquarters via satellite and automatically replenish inventory when reduced. Information technology has improved the work efficiency between various module functions in logistics management.

3.2.3. Social

With the popularity of information technology and improving people's education level, people are more readily accepting the online shopping model. In addition, due to the impact of the previous COVID-19 pandemic, online shopping has become the norm [8]. This is more conducive to leveraging the advantages of Walmart's global procurement and automated logistics system. More sales made through e-commerce have reduced the cost of goods.

3.2.4. Political and the Law

China's economy has developed rapidly, its overall economy has maintained rapid development, and its comprehensive national strength has increased significantly. In 2022, China's GDP exceeded the \$18 trillion mark for the first time, and its per capita GDP reached \$127 million. The increase in personal income will increase the per capita disposable income, increase the potential of consumers, and enhance the purchasing power of consumers. Walmart's business is worldwide, and each country's political stability and social environment also impact its development. For example, factors such as unstable political situations, serious terrorism problems, and social unrest in some countries may increase business risks. China has formed a legal framework for a socialist market economy. After the constitution's second amendment, provisions were added to support the joint development

of various types of ownership and the development of a socialist market economy. With the development of society and forming of a community with a shared future for humanity, restrictions on the import and export of various products have been gradually reduced.

In addition, Walmart needs to carry out risk management of its management information system according to the political and economic environment of different countries or regions, such as the control of supply chain operation, the establishment of a decision support system, and the improvement of anti-corruption mechanisms.

4. Supply Chain System Analysis

Walmart's supply chain management is reflected in four aspects: customer demand management, supplier relationship management, logistics distribution system management, and supply chain information system management, showcasing its excellence.

4.1. POS and Barcode Application System

Walmart's POS system is a point-to-point sales system used for retail businesses, involving aspects such as order management, payment, inventory management, price management, and promotion control [9]. When all products are labeled with barcodes, retailers can scan them with a barcode scanner during the sale, automatically entering the computer and cash register. The computer can retrieve the relevant information from the database and display it on the cash register. The applicable data generated during this process will be transmitted to the headquarters simultaneously, providing management personnel with sales categories and quantities for product allocation. Finally, the order data is sent to the logistics distribution center to replenish retail stores promptly.

The application of the POS system has improved cashier efficiency and reduced the error rate caused by manual operations for retailers. The ability to collect data is enhanced, allowing data collection at the point of information occurrence, which makes the data more accurate and reliable. The information sharing capability of the entire system can timely grasp the inventory quantity and understand the sales and unsalable status of products.

4.2. QR System

The core of a QR system is to accelerate the response speed of the supply chain by integrating and consolidating various links in the supply chain [10]. Coordination between information collection, planning, and execution is required.

Walmart pre-determines the format for sending POS data and transmits it to suppliers through an electronic data interchange system. Suppliers can understand the sales of their products and grasp any changes in demand by analyzing the data sent by POS. They can then adjust their production plans accordingly. Before delivering the goods, suppliers first send a shipping list to Walmart. Upon receiving the goods, they only need to scan the logistics barcode on the product packaging and check the list on the computer. This saves much working time and costs.

4.3. Communication Satellite System

Walmart has established a series of control activities for this interactive communication system. With the satellite control platform as the core and using UPCs to manage goods, all transport fleets in Walmart's distribution system are equipped with Global Positioning System (GPS) so that by scanning the product's UPC, Walmart can not only know how many of this product is in store but also how many are in transit and when they will arrive. These data are transmitted to the data center through the backbone satellite and communication satellite. Managers can monitor them in real-time

to ensure the regular operation of the entire process. The data center connects with suppliers to achieve rapid response supply chain management. Manufacturers can directly access the data center through the operating system and obtain the flow information of goods from the POS. This allows the distribution center, suppliers, and each sales point of every store to form an online operation. At every node of the supply chain, the information flow is two-way, following the principle of information sharing, making the exchange of information and goods in Walmart more efficient, effective, and reliable, thereby increasing the overall efficiency of the supply chain [11].

4.4. Electronic Data Interchange

Electronic Data Interchange (EDI) is the computer-to-computer exchange of business documents between companies in a standard electronic format. EDI transforms paper-based information into machine-readable electronic data, which is then transmitted between computer systems of different companies using a standardized messaging form [12]. Its Messages are composed of data elements representing important business information, and they use standardized structures to organize these elements. This makes it possible for different companies to communicate in a common language, regardless of their internal information systems. The transmission of EDI messages is done through a Value-added Network (VAN), a secure electronic mailbox, or a direct connection between two companies. When an EDI message is received, it is automatically processed by integrating it into the recipient's information system, eliminating manual data entry. EDI is the technical basis of information exchange between Walmart and its suppliers and manufacturers.

5. Advantages of Informatization

Walmart's information-based management has significantly impacted its operations and overall success. By utilizing a shared computer system and data sharing, Walmart can streamline its supply chain management, inventory control, and ordering processes [13]. This has resulted in more efficient operations, reduced costs, and improved customer service.

In addition, Walmart's use of technology and data analytics has allowed the company to make more informed decisions and respond quickly to changing market trends. This has enabled them to stay ahead of their competitors and maintain their position as a leader in the retail industry.

Furthermore, Walmart has established strong relationships with its suppliers and vendors through its management information systems. By sharing data and information, Walmart works closely with its partners to optimize the supply chain and ensure the timely delivery of goods. This has resulted in several benefits, such as improved operational efficiency, customer experience, cost reduction, strengthened brand management, and improved employee productivity. Walmart's worldwide highly automated supply chain network enables faster and more accurate business operations and optimizes inventory and order management, logistics, and distribution, improving operational efficiency and customer satisfaction. The use of data analysis and AI technology helps Walmart to understand customer needs better and provide more accurate products and services, further improving customer satisfaction. The automation and optimization of supply chain and logistics management through information systems have reduced costs, and Walmart has further reduced costs through intelligent procurement and supplier cooperation. Information systems enable Walmart to control its brand image and reputation better, using social media and data analysis to understand customer feedback and market trends and improve its products and services, increasing brand value. Walmart's information system provides a convenient way for communication and collaboration, enabling employees to complete work more efficiently. Additionally, information systems support employee training and development, improving their productivity and skill levels.

Overall, Walmart's information-based management has had a transformative effect on the company and the retail industry. It has enabled Walmart to operate more efficiently, make better decisions, and provide better service to its customers while setting the standard for the industry.

6. Conclusion

Management information systems have been critical to Walmart's success, allowing it to operate more efficiently, make better decisions, and stay ahead of its competitors. The systems have enabled Walmart to create a highly integrated and streamlined supply chain, which has resulted in better customer service and lower costs.

The case study of Walmart's management information systems has some limitations. One limitation is that the study focuses on Walmart's operations and may not apply to other companies or industries. Additionally, the study does not address the potential negative impacts of the company's management information systems, such as data privacy concerns or the impact on employees.

Furthermore, the study needs to comprehensively analyze the costs and benefits of implementing and maintaining the management information systems. This could limit the applicability of the findings to other organizations considering similar technology investments.

Finally, the external analysis for Walmart in this study has certain time and geographical limitations and only represents the current situation, such as changes in regulations or economic conditions. It couldn't represent the situation in the future or different countries. This could limit the generalizability of the findings to other organizations operating in different contexts.

In conclusion, while the case study provides valuable insights into the benefits of Walmart's management information systems, it is important to consider its limitations when applying the findings to other organizations or industries.

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