

Cross-Border Toy Supply Chain Management from a Global Perspective

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Abstract: Over the past few decades, the wave of globalization has dramatically changed the landscape of production and consumption, including the toy industry. This paper delves into the contemporary landscape of cross-border supply chain management within the toy industry, meticulously examining the principal challenges it faces and the lucrative opportunities it presents. Through a rigorous analysis of the toy supply chain amidst the backdrop of globalization, this paper identifies the pivotal factors that influence both efficiency and sustainability. Based on our findings, we formulate countermeasures aimed at addressing these challenges. The discussion is centered on strategies for optimizing supply chain management and bolstering competitiveness, emphasizing technological innovation, fostering greater transparency within the supply chain, strengthening partnerships, and ensuring compliance with international trade regulations. By doing so, it aims to contribute to the advancement of supply chain practices in the toy industry, ensuring its resilience and success in the global market.

Keywords: Cross-border toy supply chain, Supply chain management, Globalize, Technological innovation, Sustainable development

1. Introduction

As the economy becomes more globally integrated, toy manufacturers and retailers are increasingly relying on multinational supply chains to meet changing consumer needs around the world. Such cross-border supply chains involve not only complex logistics and distribution networks, but also considerations of cross-cultural communication, international trade regulations, and global market dynamics. Therefore, cross-border toy supply chain management has become a key factor in ensuring the efficient and sustainable development of the toy industry [1].

However, cross-border toy supply chain management from a global perspective faces many challenges. These challenges include the risk of supply chain disruption, cost control, quality assurance, and dealing with uncertainties in the global market. Particularly in recent years, the volatile global trading environment, geopolitical tensions, and global health crises have further exacerbated these challenges [2]. Therefore, companies in the toy industry need to adopt innovative strategies and technologies to improve the transparency, flexibility and resilience of the supply chain.

This paper aims to explore the strategies, challenges and opportunities of cross-border toy supply chain management from a global perspective. By analyzing the globalization characteristics,

management strategies, and future trends of the toy supply chain, this paper aims to provide in-depth insights and practical suggestions for toy industry enterprises and researchers to promote the continuous optimization and development of the global toy supply chain.

2. Global Characteristics of the Toy Supply Chain

2.1. Structure of the Global Toy Supply Chain

The global toy supply chain includes the entire process from the entrepreneurial design of the IP to the sale to the consumer through a series of means. Each link is an important part of the global toy supply chain. The global toy supply chain generally includes the following key links:

Design: The design process is the starting point of the entire toy supply chain. The most fundamental problem of the sales of a toy product often depends on the design of the toy. This process needs to concretify the abstract creativity and finally show it on the product. In the context of today's globalization, the design of toys usually takes into account different countries, regions and cultural backgrounds, and combines the consumption preferences of consumers in different regions of the world and local market trends to design toys [3].

Production: The production process includes the selection and procurement of raw materials, the production of toy parts, the assembly of these parts, and the final packaging of the product. To reduce the cost of production and increase the profit of sales, many toy companies will set up production bases in countries or regions with low labor costs, such as China, Vietnam, Indonesia and so on. Even the toy company will directly to the toy factory in these areas to take bulk goods for sale.

Logistics: The logistics process is responsible for transporting manufactured toys from the factory to warehouses, wholesalers or retailers around the world. The transportation of the transnational toy industry is mostly adopted by sea, because sea transport has the advantages of large transportation capacity and relatively low cost, this process is collectively referred to as international freight. After this link, there is customs clearance, and the final merchant pick-up and distribution link.

Distribution: The distribution link is the distribution of toys from the central warehouse to various points of sale, toy companies often have their own toy sales network, including online e-commerce sales platforms, online shops or offline retail stores, and business super [4]. The global distribution network allows toys to enter different markets quickly.

Retail: The retail link is the last in the global toy supply chain, and retail is direct to consumers. Toys are sold to consumers through a variety of retail channels, including integrated retailers, toy stores, and online marketplaces.

2.2. Possible Challenges in Global Toy Supply Chain Management

Global toy supply chain management may face the following series of challenges:

Trade barrier: Different countries and regions will have different trade policies, and tariff and non-tariff barriers may affect the cross-border circulation of toys, increasing transaction costs and time delay [5].

Transportation cost: International transport involves significant logistics costs, especially in the context of fluctuating oil prices and tight transport capacity. Managing logistics costs effectively and choosing the right mode of transportation is crucial to keeping a toy company competitive.

Supply chain disruption: Political instability, health crises, environmental, climate and other factors can cause supply chain disruptions. The toy industry needs to build resilience strategies and certain prevention mechanisms to deal with these unpredictable risks.

Quality control: Maintaining product quality in cross-border production and supply is a major challenge. The quality of toy products and the material composition need to meet the testing standards

and certificate inspection requirements of different countries and regions, and toy companies need to implement strict quality control standards and supervision mechanisms on a global scale.

Cultural difference: Multinational toy companies and global marketing activities need to overcome the challenges of cultural differences, and need to respect the cultural customs of the place of sale, including differences in language barriers, business practices and consumer preferences. The design and packaging of toys also need to be adjusted accordingly.

The toy industry needs to overcome these cross-border supply chain management challenges through effective strategies and technological solutions to achieve more efficient and sustainable global operations.

3. Toy Cross-Border Supply Chain Management Strategy

Next, by analyzing the application of information technology, big data, artificial intelligence, and blockchain in cross-border toy supply chain management, we will explore how to improve efficiency, reduce costs, and enhance transparency in the toy industry through technology application, supply chain collaboration, and sustainable supply chain management. The discussion focuses on cooperation mechanisms among suppliers, manufacturers, logistics service providers and retailers, as well as strategies for achieving environmental sustainability and social responsibility [6].

First of all, we need to understand the role and status of the application of technology and big data in the cross-border supply chain management of toys. Information technology and big data play a crucial role in supply chain management, especially in cross-border operations [7]. Toy manufacturers can analyze data in real-time through information technology, accurately predict market demand, optimize inventory levels, and reduce the risk of excess or shortage. Here are two applications of AI in cross-border toy supply chain management:

Demand forecasting: By analyzing social media and online sales data, toy companies use machine learning models to predict market demand and product mix for specific toys, thereby adjusting production volumes and logistics plans.

Supply chain visualization: Toy companies implement advanced analytical dashboards to monitor the status of the supply chain in real-time, including material purchase, production schedule and logistics information, in order to quickly respond to any potential disruptions and monitor all aspects of the supply chain in real-time.

Second, the application of artificial intelligence (AI) techniques, such as machine learning and predictive analytics, is used to optimize the supply chain decision-making process. AI technologies are redefining supply chain management, especially in complex and dynamic cross-border environments. AI can help the toy industry identify patterns and trends in the supply chain to anticipate and address potential supply chain disruptions and provide solutions. At the same time, it can reduce uncertainty in the supply chain, improve the speed and quality of decision-making, and automate repetitive tasks. Here are two applications of AI in cross-border toy supply chain management:

(1) **Automated warehouse management:** Toy companies can use robots and automated systems to manage warehouses, improve order processing speed and accuracy, and reduce labor costs.

(2) **Transportation optimization:** Toy companies can use AI algorithms to analyze various transportation options and routes to help toy companies choose the best transportation mode, thereby optimizing logistics costs and time to ensure on-time delivery.

Third, Blockchain technology provides unprecedented transparency and security for toy cross-border supply chain management. In the toy industry, this means that every step from the sourcing of raw materials to the delivery of the final product can be documented and verified, thus guaranteeing product quality and compliance. Here are two applications of blockchain technology in cross-border toy supply chain management:

(1) Raw material traceability: Toy companies can use blockchain technology to record the source of raw materials to ensure that all materials meet environmental and ethical standards.

(2) Anti-counterfeiting: Toy companies can create a unique digital identity for each product through blockchain technology, and consumers can easily verify the authenticity and origin of the product.

4. Sustainable Management of Cross-Border Toy Supply Chains

In addition to the use of advanced management techniques and strategies, sustainable supply chain management is also particularly important. Sustainable supply chain management emphasizes environmental sustainability and social responsibility, including green supply chains and ethical sourcing [8]. In the toy industry, this means choosing to use environmentally friendly materials, reducing waste and carbon emissions, and ensuring that workers in the supply chain adhere to ethical standards. Implementing a green supply chain strategy will not only help protect the environment, but also enhance the brand image and attract more sustainably-conscious consumers. Sustainability is not only about ecological protection but also about the social responsibility and long-term development of toy companies.

Environmental sustainability:

Green sourcing: Toy companies need to choose environmentally friendly raw materials in the procurement of raw materials, such as the use of renewable resources or recycled materials to re-produce new toys.

Energy conservation and emission reduction: Toy companies need to adopt energy-saving technologies and methods in the production process of toys to reduce greenhouse gas emissions and reduce environmental pollution. Toy companies should also adopt circular economy principles to reduce waste generation and emissions through recycling and reuse.

Economic benefits:

Cost-effectiveness: From the perspective of the long-term development of toy companies, the adoption of sustainable strategies can reduce the use of toy raw materials, reduce the consumption of energy and water, reduce the production cost of toy companies, and thus increase profits.

Brand value: The implementation of sustainable cross-border supply chain management can enhance the social image and reputation of toy companies, help attract more consumers, especially those with strong environmental awareness, and improve their market competitiveness so as to better seize market share [9].

Social responsibility:

Fairness and justice: Toy companies need to ensure fair treatment of workers in cross-border supply chains and prohibit child and forced labor. Comply with local laws and regulations, reasonable competition trade.

Community participation: While participating in local trade, toy companies should also pay attention to local social development, actively participate in community construction, and support local development. This can be done, for example, by creating educational programs or providing jobs for local people.

5. Cross-Border Supply Chain Management of LEGO Company.

From the perspective of raw material procurement, Lego company attaches great importance to the procurement of raw materials. Lego is committed to using sustainable materials to reduce the environmental impact of material consumption. In the selection of suppliers for its raw materials and in the procurement process of raw materials, the Lego company carries out a rigorous life cycle

assessment of raw materials. In the meantime, Lego uses a global sourcing strategy to ensure the quality of its raw materials while minimizing cost-effectiveness and environmental impact.

In terms of the assembly of the original building blocks, LEGO's original assembly process has achieved a high degree of automation, the whole process uses precision mechanical instruments and advanced technology. The Lego factory produces more than 200 million bricks every day, involving more than 3,700 unique parts and 60 colors, demonstrating the effectiveness of the LEGO company's efficient assembly process and management, and the robotization and automation systems within the LEGO factory ensure that the toy assembly process is efficient and precise.

When it comes to the transportation of toy products, Lego's commitment to sustainability is also a core part of its supply chain management strategy. Lego has optimized its global logistics network to reduce transportation distances and times by establishing production sites near key markets, such as a carbon-neutral plant in Virginia, USA. Lego has diversified its transportation methods and strategies, such as increasing imports from Europe to cope with the temporary closure of factories in Mexico and China, to improve transportation efficiency and reduce costs. Lego has also committed to reducing its carbon emissions by 37 percent by 2032, reflecting Lego's commitment to reducing its environmental impact throughout its supply chain, including raw materials and distribution.

In the face of the global pandemic, Lego has also shown its supply chain is extremely flexible and effective management. During the COVID-19 pandemic, Lego achieved a 7% increase in annual revenue through an upgraded e-commerce platform and flexible supply chain management, with a 14% increase in direct-to-consumer sales. Lego's e-commerce platform upgrades and supply chain flexibility have supported sales growth during the pandemic. Lego has an extensive retail distribution network around the world, including brand flagship stores, speciality stores and online stores, ensuring that products reach consumers quickly and efficiently.

In conclusion, Lego's global supply chain management demonstrates innovation and efficiency at all levels, from sourcing raw materials to final product sales, demonstrating a deep commitment to sustainability, efficiency and customer satisfaction. By continuously optimizing its cross-border supply chain, Lego has successfully responded to changes in the market, met the needs of consumers around the world, and is committed to reducing its environmental impact while maintaining business growth.

6. Conclusion

This paper mainly introduces the important position and role of cross-border toy supply chain management in the historical background of globalization and focuses on five important links in cross-border toy supply chain and the possible challenges it may face [10]. Then it introduces three main technologies that can be used in today's toy cross-border supply chain management and their corresponding application cases. Then it introduces the importance of sustainable development strategy for cross-border toy supply chain and the key aspects that toy companies need to ensure sustainability and corresponding strategies. Finally, the above point is further demonstrated through the success of LEGO in the cross-border toy supply chain. To sum up, toy cross-border supply chain management plays a crucial role in the tide of globalization. With the development of technology and the popularization of the concept of sustainable development, this field will continue to face new opportunities and challenges. To stay ahead of the competition in the fierce global market, toy manufacturers and supply chain managers must constantly innovate to meet changing market demands and environmental challenges.

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