

E-commerce Enterprise's Supply Chain Green Transformation Strategy

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Abstract: With the increasing awareness of social environmental protection and the widespread concept of sustainable development, enterprises gradually realize the importance of environmental responsibility in the process of operation. For e-commerce enterprises, their green transformation in supply chain management has become an inevitable trend. Especially in the modern consumption model, e-commerce enterprises not only need to improve operational efficiency and customer satisfaction but also must actively respond to increasingly stringent environmental regulations and consumer demand for green products. Therefore, promoting the green transformation of the supply chain not only helps to reduce the environmental impact but also enhances the social image of the enterprise and enhances the competitiveness of the brand. Taking e-commerce enterprises as the research object, this paper systematically combs the core issues of green transformation of the supply chain, including specific challenges such as cost problems, shortage of technology and talents, and changes in policies and regulations. In view of these problems, optimization strategies are put forward from the aspects of reducing cost, introducing technology and talents, and coping with policy changes. This paper aims to provide scientific reference suggestions for the green supply chain transformation of e-commerce enterprises to help them achieve sustainable development goals.

Keywords: e-commerce enterprises, supply chain management, green transformation.

1. Introduction

In the era of industrial economy, the rapid development of material civilization greatly increased the supply of products but caused a serious waste of resources and extreme climate. In the face of increasing environmental problems, changing the economic development model has become the basic consensus of all countries in the world. For enterprises, promoting business energy conservation and emission reduction and accelerating the construction of green supply chains are not only necessary actions to improve resource utilization efficiency and control operating costs but also effective ideas to adapt to the trend of green transformation and achieve sustainable development [1, 2]. This paper takes e-commerce enterprises as the research object, explores the key points of the green transformation of the supply chain, explores a new green cooperation model, promotes the upstream and downstream of the supply chain to jointly promote the green transformation, and provides inspiration for relevant enterprises.

According to data from the National Bureau of Statistics, in 2022, the national e-commerce transaction volume reached 43.83 trillion yuan, and the national online retail sales reached 13.79 trillion yuan, of which the online retail sales of physical goods reached 11.96 trillion yuan, an increase of 6.2% over the previous year, accounting for 27.2% of the total retail sales of social consumer goods. From January to November 2023, the national online retail sales reached 13,957.1 billion yuan, an increase of 11.0%. Among them, the online retail sales of physical goods reached 11,770.9 billion yuan, an increase of 8.3%, accounting for 27.5% of the total retail sales of consumer goods. In the online retail sales of physical goods, food, clothing and use goods increased by 12.0%, 9.2% and 7.5% respectively [3].

In the past, e-commerce companies mainly pursued rapid expansion and profit maximization and paid less attention to the environmental impact of the supply chain. With the increasing global attention to environmental protection and the promulgation of relevant policies and regulations, some e-commerce enterprises have begun to try to make initial environmental improvements in packaging, logistics and other links [4, 5]. Then, the transformation task still has a long way to go, and there are problems such as large cost pressure on enterprises, uneven consumer awareness of green consumption and difficulties in green supply chain coordination among enterprises.

Taking e-commerce enterprises as the research object, this paper sorted out the core issues of the green transformation of the supply chain, and proposed optimization strategies from the aspects of reducing costs, introducing technology and talents, coping with policy changes, etc., aiming to provide e-commerce enterprises with green supply chain management strategies and methods, help enterprises achieve sustainable development, and meet the market demand for environmentally friendly products. Enhance the competitiveness of enterprises and brand image. It also provides a reference for the government to formulate relevant policies and industry standards, promotes the transformation of the e-commerce industry to a green and sustainable direction, provides guidance for the collaborative cooperation between e-commerce enterprises and suppliers, logistics providers and other partners, and promotes the green development of the entire supply chain.

2. Green Transformation of The Supply Chain

2.1. Cost Problem

The green transformation of the supply chain usually requires enterprises to invest in multiple links, including purchasing environmental protection equipment and updating technical systems, which undoubtedly puts higher requirements on the capital and resources of enterprises [6]. For example, the construction of green storage facilities requires not only the installation of energy-efficient cooling and lighting systems but also the use of environmentally friendly building materials, which require a high upfront investment. In addition, the cost of green packaging materials is higher than that of traditional packaging materials, while some green materials are not fully mature in performance, such as toughness, moisture resistance and other aspects may still have certain deficiencies, further increasing the cost of use. At the same time, more environmentally friendly logistics delivery methods, such as the introduction of electric vehicles or the optimization of transportation routes, will also lead to higher operating costs, including equipment maintenance, technical modifications, and the potential impact on operational efficiency. The combination of these inputs and additional costs puts companies under greater economic pressure in the process of green supply chain transition, which is a major obstacle to advancing the Sustainable Development Goals.

2.2. Skills and Talent are in Short Supply

Some advanced green technologies, such as blockchain for product traceability to ensure the authenticity of green products, big data and artificial intelligence for optimizing green logistics

distribution routes, are more difficult to apply [7]. E-commerce companies need time and resources to learn and apply these technologies; Green supply chain involves knowledge in multiple fields, including environmental science, supply chain management, information technology, etc. At present, compound talents with such knowledge are scarce, and internal employees may also need a lot of training to adapt to the requirements of green transformation.

2.3. Policy and Regulatory Uncertainty

2.3.1. Platform Rules to be Improved

The platform's rules for the definition, labeling and promotion of green products may not be clear. Some e-commerce platforms may not have unified certification marks for green supply chain products, or the traffic support policies for green stores are unstable [8]. Moreover, when dealing with violations of green rules, penalties and supervision may also be vague, resulting in some bad merchants not strictly complying with the requirements of the green supply chain in order to reduce costs, affecting the market environment of fair competition, and also bringing challenges to e-commerce enterprises that really want to carry out green transformation.

2.3.2. Changes in Government Environmental Policy

On the one hand, the direction, standards and requirements of policy may change as environmental science develops and understanding of environmental issues deepens. For example, the accounting method and regulatory scope of carbon emissions may be constantly adjusted, which makes it difficult for e-commerce enterprises to accurately plan the green transformation strategy of the supply chain because they are uncertain whether the carbon emission quota will be stricter in the future, or whether the environmental protection subsidy policy will continue [9]. On the other hand, regional policy differences can also cause problems. Local certification standards for green products, environmentally friendly packaging requirements and other aspects may be different, which makes cross-regional e-commerce enterprises in the supply chain management need to deal with complex and different rules. With the proposal of the "double carbon" goal, the policy's guidance trend of low-carbon e-commerce is more and more obvious. In 2019, the National Development and Reform Commission jointly put forward Opinions on Promoting High-quality Development of Logistics and Promoting the Formation of a Strong Domestic Market, emphasizing the development of a green supply chain through green logistics. Subsequently, the State Municipal Regulatory Bureau also made instructions for green packaging, proposing to speed up the packaging management of "green, reduced, recyclable". The proposal of relevant policies not only provides guidance for the low-carbon development of fresh electricity suppliers but is also an important driving force for its sustainable development. In the future, with the further development of e-commerce, the standard formulation, policy support and supervision system led by the government will also be continuously improved [10].

3. Suggest and Optimize Strategies

3.1. Cost Problem

To solve the cost problem, enterprises can reduce the procurement cost through centralized procurement or alliance procurement. Multiple e-commerce enterprises can join forces to focus on placing orders to suppliers of environmental protection equipment and green packaging materials and use the scale effect of collective procurement to enhance bargaining power, so as to obtain discounts and reduce the procurement pressure of individual enterprises. Especially for some high-value

equipment and materials, the centralized procurement model can significantly spread the cost and reduce the overall expenditure of procurement. In addition, for those expensive environmentally friendly production equipment, enterprises can consider leasing models. By paying rent according to the length of use or production, the need for a large one-time investment is avoided. For example, for some e-commerce fresh enterprises with seasonal fluctuations in demand, leasing cold chain environmental protection transportation equipment is more economical than direct purchase, which not only reduces the financial pressure of enterprises but also improves the utilization rate and flexibility of equipment.

Secondly, e-commerce enterprises should also actively apply for the relevant support policies of the government, especially special subsidies and tax deductions for green technology research and development. By striving for government support funds, enterprises can invest funds in internal research and development teams, improve packaging design, research and development of simple and environmentally friendly production processes, etc., in order to reduce dependence on external materials and equipment and reduce procurement costs. In addition, cooperation between enterprises and universities or scientific research institutions can also play an important role in reducing costs. With the help of external scientific research forces, enterprises can overcome the high cost of green materials and equipment, especially in the substitution and innovation of materials, and use efficient research results to bring low-cost new technologies to enterprises. The achievement transformation of colleges and universities can provide enterprises with green technologies with market competitiveness. By providing practical scenarios and data feedback, enterprises not only help the commercialization of scientific research results but also accelerate the application and popularization of green technologies.

3.2. Skills and Talent Shortages

To solve the problem of technology and talent shortage, enterprises can take the following comprehensive measures: First, enterprises should pay attention to internal training, and provide employees with knowledge and skills training related to green supply chain through systematic courses, covering green procurement, environmentally friendly production technology, green logistics and other contents, so as to improve the professional quality and practical ability of existing employees. Secondly, enterprises can actively introduce external professionals, establish cooperative relations with universities, scientific research institutions and other industries, and absorb talents with rich experience and innovation ability in the field of green supply chain, to provide professional support and strategic guidance for enterprises. In addition, e-commerce enterprises can also cooperate with technology companies to jointly research and develop innovative technologies for the green transformation of the supply chain, or set up special research and development funds to support the development and application of green technologies to ensure that enterprises occupy technical advantages in industry competition. Through the above measures, enterprises can effectively solve the problem of technology and talent shortage, comprehensively improve the capacity of green supply chain construction, and achieve long-term sustainable development goals.

3.3. The Issue of Policy and Regulation Changes

The dynamic changes in policies and regulations have put forward new requirements and challenges for enterprises' green supply chain transformation. In order to cope with these changes effectively, enterprises can start from two aspects: strategic research and mechanism construction.

On the one hand, enterprises should strengthen the research and prediction of policies and regulations. The formulation and adjustment of policies often directly affect the operation mode and development direction of enterprises. Therefore, enterprises should set up special policy research

teams, or carry out in-depth cooperation with professional organizations such as universities, think tanks and consulting institutions. The research team needs to pay close attention to the environmental protection policies issued by the national and local governments, such as the green supply chain regulations jointly issued by the National Development and Reform Commission, the Ministry of Commerce, the Post Bureau and other departments, track the policy release dynamics, analyze the policy content, and identify potential opportunities and risks. At the same time, enterprises can use big data analysis technology to scientifically predict the possible direction of future policy changes by integrating historical policy data, industry development trends and expert opinions. For example, by analyzing the frequency and intensity of policy adjustment, the people can predict the possible rules and standards, provide a reliable basis for enterprise technology research and development, equipment procurement, resource allocation and other aspects, and help enterprises better cope with the uncertainty brought by policies.

On the other hand, enterprises need to establish flexible and efficient coping mechanisms to ensure that they can react quickly when policies are adjusted. First, enterprises should optimize the internal management process and build a flexible decision-making and execution framework, so that the goals, plans and implementation programs of green supply chain transformation can be quickly adjusted with policy changes. Secondly, policy simulation exercises should be carried out regularly to evaluate supply chain operation plans under different policy scenarios, so as to ensure that enterprises can quickly switch strategies in the face of sudden policy adjustments and avoid compliance problems or business disruptions. In addition, enterprises should also strengthen communication with government departments, and understand the direction and background of policy formulation by actively participating in the collection of opinions and industry symposia, so as to gain more time for enterprises to adapt and adjust.

4. Conclusion

With the increasing social attention to environmental sustainability, the green transformation of the supply chain of e-commerce enterprises has become an unavoidable trend. In order to comply with this development direction, e-commerce enterprises need to promote the green transformation of the supply chain from multiple aspects. First of all, optimizing packaging design is a key step, and enterprises should prioritize the use of environmentally friendly degradable materials, reduce the use of disposable packaging, and reduce plastic pollution. In addition, the promotion of green transport is also an important link, enterprises can choose low-carbon transport vehicles or promote the electrification and intelligence of freight vehicles, reducing the negative impact on the environment during the transportation process. Secondly, e-commerce enterprises should give priority to those suppliers with environmental certification when selecting suppliers to ensure that environmental standards are implemented throughout the supply chain.

At the same time, e-commerce enterprises can accurately forecast product demand by using advanced technologies such as big data, thereby reducing overproduction and inventory overhang, optimizing resource utilization, and reducing waste. In addition, companies can use incentives to induce consumers to participate in green initiatives. For example, enterprises can set up a green points reward system to encourage consumers to choose environmentally friendly packaging, green logistics and other options, thereby promoting the popularity of green consumption concepts.

In the future practice, e-commerce enterprises should actively promote the green transformation of the supply chain, which will not only help reduce the environmental impact, but also enhance the social responsibility and brand image of enterprises, and enhance market competitiveness. Green transformation brings a long-term strategic advantage to enterprises, which can not only respond to the growing environmental protection needs of society and consumers but also occupy a favorable position in the fierce market competition and create a sustainable corporate image.

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