Research on Jinan Green Logistics Development Strategy Based on SWOT Analysis

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Abstract. With the prosperous development of China's e-commerce industry, the logistics industry has become a core force supporting the growth of the national economy. This transformation has not only changed the shopping habits of consumers, but also had a wide impact on the entire economic structure. This thesis adopts SWOT analysis to deeply analyze the strengths and challenges of developing green logistics in Jinan. Through a questionnaire survey of local logistics practitioners, it reveals Jinan's key problems in promoting green logistics, such as technological shortcomings, insufficient innovation capacity and lack of talents.

Keywords: Green Logistics, SWOT Analysis, Jinan

1 INTRODUCTION

Driven by the wave of globalization and technological advances, the logistics industry has become a dynamic artery in the modern economy, connecting every link between supply and demand, and building bridges for business exchanges. Along with the rapid growth of logistics, environmental issues are becoming more and more prominent. Against this background, green logistics has emerged as a key chapter in the transformation and upgrading [1].Therefore this study focuses on the development strategy of green logistics in Jinan, aiming to promote the greening process of Jinan's logistics industry through analysis and planning This study chooses the SWOT analysis method to comprehensively assess the strengths, weaknesses, opportunities and threats of Jinan's logistics industry in the green transformation, and seeks to find universal solutions in the localized practice.

2 LITERATURE REVIEW

Jefimovaite, L from Lithuania, by studying Lithuania's green logistics policy in the EU, found that reducing the negative impacts of transportation is an important goal of the EU policy. Key areas of related activities: transition to less polluting and most efficient modes of transportation, more sustainable transport technologies, use of fuel types and

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infrastructure measures, and the desire to ensure that transport prices adequately reflect negative impacts on the environment and health[2]. Van Vo, Hien, from Viet Nam, argued that organizations, and managers should issue regulations on green transportation, packaging, distribution, and energy use. Green reward policies are necessary when businesses require employees to work for them. reward policies are necessary when businesses require employees to contribute to green logistics[3]. A Longoni in his study found that the research on the theoretical level of green logistics mainly focuses on the essential characteristics of green logistics, development motivation and performance evaluation research[4].

3 SWOT ANALYSIS

There are four influencing factors in the SWOT analysis which are Strengths,Weaknesses,Opportunities,Threats. Its components are shown in Figure 1.

3.1 Scale Reliability Analysis

This study conducted a questionnaire survey on the development status of green logistics in Jinan for practitioners in the logistics industry in Jinan, with a total of 200 questionnaires issued and 184 valid questionnaires returned. The table is designed as shown in table 1 below. Through the SWOT analysis, we can understand more clearly the position of Jinan logistics enterprises themselves in the comprehensive environment, and also study the problems facing the current development of logistics enterprises in Jinan, and formulate corresponding countermeasures based on the results of the study, so as to facilitate the targeted decision-making of logistics enterprises in Jinan.

Table 1. chart1 Variable question items and reliability analysis

variant	subject	Questionnaire content	CA
Strengths（S）	S1	Policy development related to green logistics policy is positively impacted	0.762
	S2	Preferred location and transportation networks have a positive impact on green logistics.	
	S3	Existing infrastructure has a positive impact on green logistics	
Weaknesses（W）	W1	Excessive initial cost of green logistics is negatively impacted	0.751
	W2	Green logistics technology innovation and application lagging is negatively affecting	
	W3	Lack of willingness to transform green logistics companies is negatively impacted	
Opportunities（O）	O1	Potential for economic development as a driver of green logistics	0.79
	O2	Technological advances have the potential to revolutionize green logistics	
	O3	Collaboration between business and research organizations has potential	
Threats（T）	T1	Threat of increased competition from too many green businesses	0.76
	T2	Technical barriers and cost pressures threaten green logistics development	
	T3	Fluctuating demand in the green logistics market is a threat	

Validity test is one of the ways in order to measure the validity of the questionnaire design and responses. In the validity test in this paper, first of all, using sps26.0 for exploratory factor analysis, the questionnaire KMO sampling aptitude quantity is 0.981,

greater than 0.9; Bartlett sphericity test approximate chi-square 4006.783, the value is larger; significance is approximate 0, less than 0.05. Initially, it proves that the questionnaire's structural validity is well behaved. The validation factor molecules using amos24.0 are shown in Table 2, from the data in Table 2, it can be seen that the standardized factor loading coefficients are all in the range of 0.6 to 0.7, and all are greater than 0.5, which indicates that the model's measurement relationship is better. the CR values are also all greater than 0.7 or more, which meets the standard of 0.5 or more. the AVE value is the smallest for the expected confirmation factor of 0.519, and the largest for the perceived recreation of 0.557 , satisfying the requirement of greater than 0.5, indicating that the aggregated validity of the scale was high and the questions within each variable were correlated with each other.

Table 2. Tests of aggregation validity

variant	subject	Non-standardized loads	standard error	T	P	Standardized loads	CR	AVE
S	S1	1				0.73	0.762	0.516
	S2	0.967	0.077	12.589	***	0.707		
	S3	0.963	0.075	12.763	***	0.717		
W	W1	1				0.729	0.751	0.502
	W2	0.918	0.076	12.121	***	0.698		
	W3	0.917	0.076	12.13	***	0.698		
O	O1	1				0.754	0.791	0.557
	O2	1.006	0.072	14.017	***	0.75		
	O3	0.954	0.07	13.696	***	0.735		
T	T1	1				0.747	0.776	0.537
	T2	0.888	0.073	12.173	***	0.674		
	T3	1.073	0.076	14.179	***	0.773		

3.2 Strengths

Policy Orientation and Support. Jinan City has given clear direction and support to green logistics at the policy level, and the local government has introduced a series of supportive policies and measures, such as the provision of tax incentives, preferential treatment for land-use rights, and green credits, in order to guide and encourage enterprises to transform and upgrade and adopt green logistics management systems. At the same time, policies also tend to support the research and development and application promotion of green technologies[5].

Location and Transportation Network Advantages. Jinan is located at the intersection of rail and highway networks[6], a geographic advantage that makes it an important node connecting economic circles such as Beijing-Tianjin-Hebei and the Yangtze River Delta. This network advantage gives green logistics the ability to reduce the carbon footprint of transportation routes and improve the green performance of the transportation process through effective cargo distribution and transportation networks.

Support from Existing Infrastructure. Jinan has already built a relatively complete logistics infrastructure, including international freight ports, railroad lines and logistics parks. This creates a convenient physical environment and platform for green logistics, which helps logistics enterprises to adopt energy-saving means of transportation, increase the loading rate of goods, and reduce empty loads during transportation, thereby reducing energy consumption and emissions.

3.3 Weaknesses

Initial Investment Cost. For many businesses, the initial shift to green logistics requires a huge capital investment. Transportation vehicles need to be replaced or upgraded to reduce emissions, investments need to be made in energy-efficient warehousing facilities, and environmentally friendly materials need to be used for packaging. In addition, the introduction of monitoring and management systems to track carbon emissions from the logistics process is also necessary. These initial costs can be a barrier for SMEs in particular, as they may not have sufficient funds to undertake these changes.

Lagging Technological Innovation and Application. Although technology is an essential part of the development of green logistics, Jinan may be lagging behind in this area. This includes insufficient application of logistics management technologies, low levels of intelligence and automation, and technologies specific to green logistics such as low-emission transportation tools and the application of renewable energy that are not yet widespread. Therefore, attention needs to be paid to talent training, technological transformation and R&D innovation in order to narrow this technology gap.

Willingness of Enterprises to Transform. In addition, traditional logistics companies may lack the incentive to transform. Traditional modes of transportation are quite mature with fixed business processes, and for enterprises to change these modes requires facing uncertainties and potential risks. Moreover, green logistics may involve long-term investments that do not see a return in the short term, which is a considerable challenge for companies under pressure to make a profit[7].

3.4 Opportunities

Drivers of Economic Development. Jinan, as the capital city of Shandong Province, has active economic development and frequent urban trade circulation, which provides a broad market demand for green logistics. In particular, the rapid development of e-commerce provides a huge space for green express delivery and packaging. In addition, the growth of industrial production and international trade requires more efficient and greener logistics support, and the enhancement of green logistics services helps enterprises reduce their carbon footprints and increase their competitiveness.

Changes Brought About by Scientific and Technological Progress. With the emergence of a new generation of information technology, the application of technologies such as the Internet of Things, big data analytics and artificial intelligence has provided technological safeguards for the efficient operation of green logistics. These technologies can help optimize route planning, improve transport efficiency, monitor and reduce energy consumption, and thus significantly reduce environmental impact.

Cooperation with Universities and Research Institutes. A number of well-known universities and research institutions in Jinan are devoted to green logistics-related research. By cooperating with these organizations, we can promote the innovation of green logistics theories and the exchange of practical experience, promote the research, development and application of new technologies and models, and cultivate professional talents, thus injecting new momentum into the development of green logistics.

3.5 Threats

Uncertainty in Environmental Regulations and Policies. Changes in environmental regulations can have a direct impact on the logistics industry. If policy changes result in stricter emission or operational standards, logistics companies that fail to adapt in a timely manner may risk fines or business disruption. In addition, policy discontinuity or inconsistent enforcement may also pose a threat to a company's long-term investment decisions.

Technical Barriers and Cost Pressures. Efficient green logistics requires advanced technological support, but the development and adoption of these technologies are costly. Reliance on technology may exacerbate the pressure on companies to invest initially, especially for those without sufficient capital for technology upgrades and stock replacement. In addition, the logistics industry suffers from resource depletion and cost pass-through, resulting in the need for companies to continuously improve efficiency while compressing costs.

Fluctuations in Market Demand. Logistics demand may fluctuate unpredictably due to economic cycles, changes in industry size and other factors. In the face of the ups and downs of market demand, especially during economic downturns, companies may need to downsize their green logistics operations, and such changes can lead to impacts on investments in green logistics, posing a threat to the sustained development of enterprises.

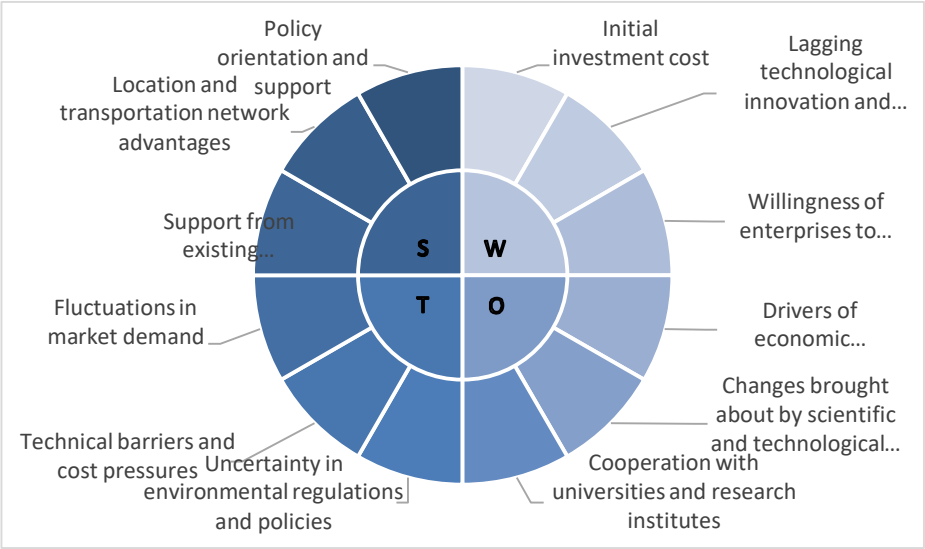

Fig. 1. Influential factors in SWOT analysis

4 PROBLEMS

4.1 Lagging Infrastructure Development

As an old industrial city, Jinan's existing logistics infrastructure has not yet fully met the requirements of green logistics. For example, logistics distribution centers and warehousing facilities are not reasonably located, leading to extended transportation paths and inefficiency. The distribution of logistics infrastructure is not balanced enough and is mainly concentrated in old industrial and urban areas, which does not meet the demand for efficient operation of modern green logistics, especially in suburban areas and new development zones where the construction of logistics facilities is not in line with the pace of urban development, resulting in a mismatch of efficiency[8].

4.2 Warehouse and Logistics Center Aging

These facilities are difficult to support the deployment and use of modern logistics system equipment, such as automated sorting systems, efficient energy use and other green logistics technologies. Cold chain logistics facilities, environmentally friendly packaging and transportation tools, etc. In the context of the rapid development of green logistics, the lack of these facilities limits the provision of green logistics services and affects the efficient and safe management of sensitive goods such as food safety and pharmaceutical transportation.

4.3 Low Overall Level of Technical Standards

Technological innovation related to green logistics in Jinan is relatively slow. Many logistics companies still use traditional logistics equipment and management systems and lack advanced logistics technologies, such as intelligent scheduling systems and efficient energy management platforms, which limits the improvement of green logistics service efficiency. In particular, small and medium-sized enterprises (SMEs) lack sufficient financial support for research and venture capital, making it difficult for them to follow up on the development and application of the latest green logistics technologies. The promotion of green logistics also requires the development of appropriate technical standards and industry guidelines.

4.4 Insufficient Policy Support and Incentives

At the policy level, although the Jinan municipal government promotes green development, there may be a lack of long-term and coherent supportive policies and incentives specifically in the area of green logistics. Even if there is a policy framework for green logistics, it is difficult to put these policies into practice if there is a lack of concrete implementation measures and supervision. Without strong regulatory measures and penalty mechanisms, companies may ignore environmental standards and opt for lower-cost traditional logistics methods[9]. In the absence of policy incentives, companies may not invest in staff training or pay attention to upgrading the operational skills of their workers in green logistics, resulting in poor implementation of green logistics.

5 ANALYSIS OF COUNTERMEASURES FOR GREEN LOGISTICS

5.1 Increase Government Support and Update Advanced Green Logistics Support Measures in a Timely Manner

The Jinan government needs to play a guiding role in the market. The government should conduct an in-depth assessment of enterprises that intend to develop green logistics and, based on their specific business status and difficulties, formulate a customized support plan that includes financial support as well as technical and management guidance. Second, the government should provide direct or indirect subsidies for the upgrading of logistics infrastructure to promote innovation in environmentally friendly facilities and processes. Further, innovative tax incentives should be provided to encourage logistics enterprises to invest in green transformation, while reducing the environmental impact of logistics activities through tax regulation. This series of measures will synergize to build a new model of green and efficient logistics and promote the forward development of green logistics in Jinan.

5.2 Focus on Top-level Design and Build a Developmental Green Logistics Innovation System

Focus on top-level design, build a developmental green logistics innovation system led by the relevant departments of the Jinan government, the active participation of logistics enterprises in Jinan, combined with the actual situation of green logistics development in Jinan, to build a developmental green logistics innovation system in Jinan, and ultimately to take the innovation-driven path of development. Further, by stimulating the innovation potential of local logistics companies, it should join hands with higher education institutions and research institutes to conduct research, jointly build a green logistics research platform, and jointly participate in the formulation of industry standards. Furthermore, the innovative strength will be strengthened by actively introducing and digesting advanced international green logistics technology and management experience.

5.3 Emphasize Talent Cultivation and Improve Human Resource Training Mechanism for Green Logistics

Cultivating a talent pool for the green logistics industry is critical to the continued development of Jinan. The government needs to step up its efforts to attract and retain professionals by providing a variety of supporting benefits, including living subsidies and housing purchase incentives. At the same time, companies should also improve salary and benefits, emphasize employees' rights and development potential, ensure smooth career development paths, and pay attention to solving practical problems in employees' work and life[10]. In order to adapt to the rapid development of modern science and technology, should also build a set of continuous staff education system, regularly update the professional knowledge of employees and new technology training, in order to enhance the overall quality and resilience of the entire Jinan green logistics personnel.

6 CONCLUSIONS

This study focuses on the development status of green logistics in Jinan, analyzes its advantages and potential shortcomings using SWOT analysis, and explores the challenges encountered by Jinan in the process of promoting green logistics, and proposes corresponding improvement strategies. This study provides reference value for other regions to promote the practice of green logistics. However, given the specificity of green logistics development in different regions and the different challenges they face, in-depth research on green logistics remains a long-term and difficult task. The study also points out that green finance has played a positive role in the development of green logistics in Jinan, not only promoting the progress of green logistics, but also providing the necessary financial support. Given its importance, further research on the application and impact of green finance in the field of green logistics is an indispensable part of the follow-up work.

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