

Research on Evaluation System of Fresh Logistics Distribution Mode

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Abstract: In the current environment, the hardware base and technical level of China's fresh logistics are relatively low, and the lack of professional logistics talents hinders the development of fresh logistics. How to promote the development of fresh logistics has become an important issue for enterprises. In order to meet the needs of consumers and to achieve sustainable development, fresh enterprises are changing, but as an emerging field, fresh e-commerce will inevitably encounter poor information, unreasonable logistics layout and consumer approval. The rate is not high and so on. Therefore, the regular evaluation and analysis of the logistics distribution model of fresh enterprises has important significance for continuously improving the level of logistics and distribution. This paper takes the evaluation of the boxed fresh Logistics distribution model as the research topic, and uses the Analytic Hierarchy Process (AHP) and fuzzy comprehensive evaluation method to evaluate and analyze the logistics distribution model of Hema Xiansheng, points out its existing problems, and puts forward some suggestions. This includes reducing distribution costs, improving customer satisfaction, and improving information technology

1. Introduction

In the current environment, China's fresh logistics hardware base and technical level are relatively low, lack of professional logistics talents, hindering the development of fresh logistics. How to promote the development of fresh logistics has become an important issue for enterprises. In order to meet the needs of consumers and to achieve sustainable development, fresh enterprises are changing, but as an emerging field, fresh e-commerce will inevitably encounter poor information, unreasonable logistics layout and consumer approval. The rate is not high and so on. These studies have explored that high logistics costs and high losses are problems in the operation of many fresh e-commerce companies, and specific technical methods are proposed. However, how to choose the appropriate logistics distribution mode and how to conduct regular evaluation and analysis will continuously improve logistics and distribution. Levels have important implications.

2. Construction of fresh liquor distribution model evaluation system

2.1. Distribution model evaluation index system

According to the characteristics of the fresh logistics distribution model, the evaluation index system is designed. In this paper, four indicators, such as distribution cost, distribution quality, core competitiveness of enterprises and policy environment, are used as the first-level evaluation indicators of fresh distribution mode. According to the four first-level evaluation indicators, 14 secondary evaluation indicators are formed, and finally the evaluation system of fresh logistics distribution mode is formed.

(1) Distribution cost indicators.

Distribution costs are a key part of an enterprise's efficiency. It is the sum of the costs spent in the distribution process. The distribution cost includes the whole process of investment cost, operation cost and related inventory cost.

Table.1. Explanation of distribution cost corresponding to secondary indicators

N O.	Secondary indicators	Explanation
1	Investment costs	The fixed cost of investment in the construction of warehouses and logistics equipment.
2	Operating costs	According to the cost of the logistics operation of the enterprise.
3	Related inventory costs	Refers to capital occupation costs, item loss costs, insurance costs and taxes.
4	Cost change	refers to the cost of changing the type of logistics distribution model

(2) Distribution quality indicators

In addition to providing better logistics services, we must also pay attention to the quality of delivery.

Table.2. Explanation of the distribution quality indicators corresponding to the secondary indicators

NO.	Secondary indicators	Explanation
1	Timeliness of delivery	The ability to deliver goods within the specified time.
2	Comprehensive versatility	Not only includes traditional logistics and distribution services, but also value-added services provided during the delivery process.
3	Distribution accuracy	Whether the product can reach the customer accurately during the delivery process.
4	Customer Satisfaction	A feeling of the customer is the comparison of the consumer's perception of the delivery service provided with his or her expectations.

(3) Core competitiveness of enterprises

Core competitiveness is an important criterion for measuring whether the logistics distribution model strategy is suitable for enterprise development. The core competitiveness of an enterprise can be measured by the logistics infrastructure, logistics distribution capability, distribution capability, and information technology owned by the enterprise.

Table.3. Explanation of the second-level indicators corresponding to the core competitiveness of enterprises

N O.	Secondary indicators	Explanation
1	Infrastructure	Distribution infrastructure includes storage facilities, delivery facilities, distribution centers, and logistics information systems.
2	Distribution ability	a comprehensive evaluation of the ability of the company in the distribution process.
3	Information technology	Includes computer technology, information classification and coding technology, Global Positioning System (GPS) and so on.

(4) Policy environment indicators

Other indicators in this paper refer to the market environment, product characteristics, and government policies.

Table.4. explains the other indicators corresponding to the secondary indicators

N O.	Secondary indicators	Explanation
1	Market environment	Whether to cater to the market environment.
2	Product characteristics	According to the characteristics of the goods, different distribution measures are taken in the distribution, such as adding ice to lower the temperature and keeping the product fresh.
3	Government policy	Whether the distribution model used by enterprises conforms to the implementation of policies and the support policies formulated.

2.2. Establishment of the weight of the evaluation index system

According to the four primary indicators and 14 secondary indicators included in the evaluation index system of the fresh logistics distribution model, the AHP method is used to determine the weight of each indicator. First, design a questionnaire and use the question method to score. 9 points means very important, 7-8 points means important, 5-6 points means general, 3-4 points means not important, 1-2 points means very unimportant. When performing statistical analysis, the higher the score, the more important the indicator is. The lower the score, the less important the indicator is in the evaluation system. The questionnaires were mainly sent to logistics experts, students of this major, employees of logistics companies, and employees of Box Ma Fresh Life. Questionnaires are mainly sent directly to handwriting, QQ, and WeChat. A total of 100 questionnaires were distributed and 93 valid questionnaires were collected. After the questionnaires were collected, relevant statistical analysis was conducted.

Through the analysis of 93 questionnaires collected, the highest frequency of the corresponding scores of the two pairs of indicators is used as the score of the relative importance of the two indicators, that is, the majority. According to the mode obtained, the judgment matrix of each level of the evaluation system can be obtained.

Table.5. Primary indicator judgment matrix

Primary indicator	Distributio n cost	distribution quality	enterprise core competitiveness	policy environment
Distribution cost	1	2	2	3
distribution quality	1/2	1	2	3
enterprise core competitiveness	1/2	1/2	1	2
policy environment	1/3	1/3	1/2	1

According to the formula, the root vector composition of the first-level index is normalized, and the feature vector = (0.41, 0.29, 0.19, 0.10) T is obtained, and the weights are 41%, 29%, 19%, and 10%, respectively. The index has the highest proportion of 41%, followed by distribution quality indicators, core competitiveness and policy. Through the calculation, CI, RI and CR four indexes, the consistency matrix of the above four first-level indicators is tested by consistency, which is =4.0709, CI = 0.0236, RI =0.89, CR=0.0265<0.1, Judgment matrix passed the consistency test. According to the same calculation process, the weight of the second-level indicator of the fresh-keeping logistics distribution model evaluation system can be determined and a one-time inspection can be carried out.

Through the weight calculation of the second-level indicators, the judgment matrix consistency test is all passed, and the first-level indicator distribution cost of the fresh-keeping logistics distribution model evaluation system index is the most important, and the highest-level investment cost is 54%; the operating cost The proportion accounted for 21%; related inventory costs accounted for 18%; change costs accounted for 7%. In the secondary indicators of distribution quality, the timeliness of distribution accounted for 54%; in the secondary indicators corresponding to the core

competitiveness of enterprises, information technology accounted for the highest proportion, accounting for 53%; in other corresponding secondary indicators, the government The policy has the highest proportion, accounting for 50%.

Table.6. Distribution cost corresponding to the second-level indicator consistency test

Secondary indicator	judgment matrix				weight W	λ max ,CI,RI,CR
Investment costs	1	3	4	5	0.5401	λ max =4.2200
Operating costs	1/4	1	2	3	0.2148	CI=0.0733
Related inventory costs	1/3	1/2	1	4	0.1754	RI=0.89
Cost change	1/5	1/3	1/4	1	0.0697	CR=0.0824<0.1

Table.7. List of other indicator weights

Secondary indicator	weight W	Secondary indicator	weight W
Timeliness of delivery	0.5427	Product characteristics	0.25
Comprehensive versatility	0.2492	Government policy	0.50
Distribution accuracy	0.1159	Infrastructure	0.3325
Customer Satisfaction	0.0922	Distribution ability	0.1397
Market environment	0.25	Information technology	0.5278

3. Cases--Evaluation of the distribution mode of Hema Xiansheng Logistics

3.1. The current status of Hema Xiansheng Logistics distribution

The delivery speed of Hema Xiansheng is fast, it can achieve delivery within three kilometers in 20 minutes, and delivery within five kilometers within half an hour. The logistics has been realized intelligently, and the cargo space and inventory of the box store goods are all scheduled in real time. Through intelligent scheduling, in the peak hours of Chinese food and dinner, store and warehouse delivery will not be busy at the same time, and there will be no problem of less work time in leisure time. Leisure time is also the peak period of order delivery.

3.2. Applying Fuzzy Comprehensive Evaluation Method for Evaluation

The above is the establishment of the evaluation index system of fresh logistics distribution model, and the weight is determined. The comprehensive evaluation and analysis of the fresh-flow distribution model of Box Horse is now carried out.

(1) Establishing a comment level

A self-operated distribution model, a third-party logistics distribution model, a common distribution model, and an interoperable distribution model are used as a collection of reviews. $V=\{\text{self-operated delivery mode, third-party logistics distribution mode, common distribution mode, inter-use distribution mode}\}$.

(2) Perform fuzzy evaluation

On the basis of the above, 300 questionnaires were distributed, and leaders and experts of logistics companies and consumers of Hema Xiansheng were invited to participate in the questionnaire. Referring to other literatures, the following scoring principle is very limited, and the provisions (10, 8, 6, 4, 2) correspond to (good, better, fair, poorer, poorest), (1, 3, 5, 7) And 9) means between the above scores. After the completion of the scoring, data analysis was performed on 289 valid questionnaires collected, and the data analysis was performed by the method of taking the majority.

(3) Evaluation results

According to the fuzzy evaluation of the questionnaire data, it can be concluded that the scores of the four distribution modes are 0.5299, 0.5088, 0.4657, and 0.3662, respectively, and the self-operated distribution mode has the highest score. At present, Hema Xiansheng is mainly based on the self-operated distribution mode, so the evaluation results are consistent with the actual

situation, indicating that the above research is valuable, and can provide reference for the improvement of the Hema Xiansheng Logistics distribution mode. The evaluation results are as follows:

The distribution cost corresponding to the secondary indicator scores are 4, 5, 5, and 5 respectively, which is lower than other first-level indicators, indicating that the cost is higher, especially the investment cost. It is recommended that Hema Xiansheng will carry out detailed site selection and appropriately reduce the storefront area to reduce investment costs.

Hema Xiansheng needs to take measures to improve customer satisfaction, such as standardizing logistics and distribution services, improving after-sales service, improving the evaluation system of logistics service development, and increasing employees. Service awareness training, improved through the application of information technology and infrastructure construction, etc.

4. Conclusion

At present, fresh distribution has the characteristics of fewer batches and more batches, which increases the complexity of distribution and operation cost, and puts forward higher requirements for logistics distribution. Therefore, optimization of logistics distribution mode is of great significance to improve logistics level. According to the characteristics of fresh delivery, the evaluation system of fresh logistics distribution mode is constructed, and the weight is determined by the analytic hierarchy process. On the basis of the above, the fuzzy comprehensive evaluation method is used to evaluate and analyze the Hema Xiansheng, and based on the results of the evaluation analysis, the suggestions for reducing the distribution cost, improving the distribution quality and improving the core competitiveness of the company are proposed.

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