

Research on Logistics Warehousing Cost of Z Delivery Enterprise and Its Optimization Strategy

Bo Zheng*, Chenxing Sun

School of Economics and Management, Southwest Petroleum University, Chengdu 610500, China

* Corresponding author

Abstract: Aiming at the fierce price competition in the logistics industry, this paper studied the logistics storage of Z Express enterprises. First, according to the current situation of the logistics enterprise, the current storage problems were found out. To discuss its storage cost in depth, the analysis is carried out from two aspects: the internal structure of storage cost and the external factors. The former uses the activity-based cost method to analyze, and is supplemented by peer benchmark comparison. The latter directly proposes countermeasures based on related issues. Finally, using fuzzy comprehensive evaluation to evaluate the proposed optimization strategy, in order to find an accurate method to optimize the logistics storage cost of Z Express enterprise.

Keywords: Storage Costs, Activity-Cost Method, Peer Benchmark Comparison, Fuzzy Comprehensive Evaluation Method.

1. Introduction

(1) Research background and significance

At present, China's economic development speed has changed from high speed to medium and high speed, but the logistics industry has just begun to develop. In the past five years, the proportion of China's total logistics expenses to GDP has decreased year by year, 16.6% and 15.7% respectively in 14 to 21 years 14.9% and 14.6%, the decline rate is decreasing year by year. In China's logistics information table, China's total logistics reached 11 trillion yuan in 2020 and 12.1 trillion yuan in 2021. It was close to 13 trillion in 2022. The cost of all industries is increasing, and in the logistics industry where market competition is fierce, there are fewer channels and more difficult channels to reduce logistics costs.

As the competition will become more and more fierce, logistics enterprises to survive and continue to develop in the market competition is determined by the core competitiveness of logistics enterprises - the efficiency and quality of logistics services. Warehouse management is an important part of the logistics services of third-party logistics enterprises. The process affects the distribution efficiency and material security of its enterprise. It is also one of the important factors that affect consumers to evaluate the comprehensive service quality of its enterprises. And warehousing as the only static link in the logistics link, has undergone qualitative changes, modern enterprise warehouse management will accumulate a large amount of funds of enterprises, for logistics as a profit point of third-party logistics enterprises is even worse, although logistics companies understand the importance of warehousing for enterprise logistics operations, obviously, the backwardness of the warehousing industry has become a bottleneck for enterprises to further reduce logistics costs and improve service levels. Therefore, the goal of the enterprise is to start from customer needs, use various new technologies and methods to improve warehousing efficiency, reduce warehousing costs, and ultimately improve the comprehensive strength of the enterprise. However, logistics companies often lack the means to make the right warehousing decisions. Especially for the decision-making of warehousing construction and the business model of logistics

enterprises, it is difficult for enterprises to use scientific and systematic means to make correct decisions. Therefore, the various costs associated with logistics warehousing management activities, also known as warehousing costs, are unquestionably important and need to be fully analyzed to make the right decisions to reduce warehousing costs.

At present, warehousing is an economic phenomenon that exists in the form of society. Efficient and low-cost warehouse management will surely bring a qualitative leap to the competitiveness of the entire logistics enterprise. In today's era of fierce competition and the pursuit of profits, reducing storage costs and improving efficiency have important theoretical and practical significance for the entire logistics industry. Enterprise logistics is composed of multiple links, and the warehousing process is one of the important links. Coordination of the entire logistics process is at the heart of logistics management. Independent research on warehousing management can make people pay attention to the problem of excessive warehousing costs and divert people's attention to find effective ways to reduce warehousing costs.

Provide a reasonable storage price basis for the entire logistics enterprise. Cost is the basis of pricing. Logistics enterprises are important businesses in their supply chains, and these companies will conduct logistics evaluation and performance evaluation. Not only do they provide a variety of warehousing services, but they will also settle according to a certain price system. Therefore, warehousing costs have become the source of unified logistics prices for enterprises in the logistics industry.

This paper takes Z Express as an example to study and analyze its warehousing management process, solve related problems and optimize its methods. Z Express was established on May 8, 2002, mainly from the transportation and distribution services of logistics resources, is a typical third-party logistics enterprise. Z Express's warehousing management has two links: first, the collection and receipt of parcels into the warehouse and the sending link; Second, the delivery of parcels into the warehouse and delivery links. The total time spent on warehousing accounts for more than 30% of the total time of the total logistics process, indicating that the level of warehousing management has a greater impact on its logistics service level. The cost of warehousing

management accounts for about 20% of the total cost of the entire logistics process, which also reflects that the level of warehousing cost will determine the profitability of the enterprise, showing an inverse correlation, and it is necessary to study the relevant problems of warehousing management of the logistics enterprise. Therefore, based on the above background, this project will focus on the logistics enterprises taking Z Express as an example to carry out in-depth research, analyze the logistics warehousing cost of Z, study the storage cost structure, carry out optimization plans for the existing problems, to alleviate the problem of excessive logistics warehousing costs in Z to a large extent, improve corporate profits, increase enterprise competitiveness, and also hope to analyze some problems and deficiencies of costs in the warehousing process for most logistics enterprises. Then it can solve these problems well or improve the plan, and also hope to give larger enterprises vigilance and as a reference for thinking.

(2) A review of domestic and international research

In recent years, the development of the industry has analyzed that China's logistics industry has considerable development prospects, and the academic community has gradually shifted its attention to warehouse management, and has studied many knowledge achievements with practical significance and operability. At present, the storage research results of the logistics industry mainly have the following three aspects:

Third-party logistics cost research. In 2011, Dong Xiaomin and Chen Lixin wrote in the article "Thoughts on Reducing Logistics Costs of China's Third-Party Logistics Enterprises". Analyze the problems existing in the logistics cost of logistics enterprises in China, study the method of internal control of enterprise cost, and aim for high operation and strong strength of logistics of Dao enterprise [1]. In 2015, Hao Haixia pointed out in the article "Analysis of China's Third-party Logistics Cost Control": Third-party logistics is the trend of logistics development, analyzes China's third-party logistics industry, puts forward logistics cost problems in the case of obtaining various problems over the years, and proposes solutions according to the actual situation [2].

The current situation of third-party logistics warehousing. In 2004, Hong Kun was published in the article "2003 Warehousing Industry Status and 2004 Trend Forecast". It shows that in 2004, the rapid development of the logistics industry will drive the rebirth of its internal industry - warehousing industry [3]. In 2009, Yue Zhaohui wrote in the article "Research on the Problems and Countermeasures of Warehousing Management of Local Logistics Enterprises". Taking X logistics company as an example, it is concluded that the enterprise has low warehousing informatization, low work efficiency, and low staff quality. From the experience of predecessors on the development of logistics enterprises, improve the degree of informatization and jointly develop the supply chain link [4]. In 2011, Guo Shanshan published the article "Analysis of Warehousing Management Mode of Logistics Enterprises in Small and Medium-sized Cities". It shows that most of the current small and medium-sized logistics enterprises have many problems, and the problem of warehouse management is particularly prominent [5].

Optimization of warehousing management mode of third-party logistics enterprises. In 1960, Clark and Searf analyzed an N-class flow system that did not consider batch volume, and whose optimal inventory control strategy was the so-called maximum order level strategy [6]. In 1996, Jinn-Tsair

Teng discussed a deterministic inventory replenishment model with a linear trend in demand [7]. In 2003, Rajesh Piplani and Viswanathan argued that SOI is a vendor based on buyers' needs. A "arrangement" for the maintenance and control of inventories jointly agreed upon [8]. In 2005, Ronald S. Tibben, Lembkea and Yehuda Bas-sok discussed inventory models based on delayed customization strategies. Various delay-related problems are stated, and various strategies are proposed to optimize the inventory level in [9]. In 2011, Yu Shumin et al. in the article "Evaluation Effect Model of Warehouse Management of Logistics Enterprises". It is believed that warehouse management is an important part of enterprise logistics management and an important indicator to meet consumer needs. In this paper, the analytic hierarchy method is used to analyze the control methods in warehouse management, and the application model of warehouse management is constructed [10]. In 2014, Wang Minghe pointed out in the article "Warehouse Management and WMS System Development". The development of warehousing is also a manifestation of the development of informatization, and the use of various high-tech and high-tech has greatly improved warehousing efficiency [11]. In the article "Analysis and Improvement of Warehousing Management in Chinese Enterprises" in 2021, Wang Mian aimed at the challenges of new management methods and theories in the traditional concepts and methods of commodity storage and circulation, and applied the knowledge and theory learned and scientific methods and theories by combining the actual situation of enterprise warehousing management. The means to study the warehousing operation process, etc., and manage the warehousing [12].

The development of modern logistics abroad is earlier, so the research on warehouse management is more mature, but the development of the domestic third-party logistics industry is relatively backward and slow, and scholars have studied and discussed the warehousing of logistics enterprises from different related aspects, and produced some important research results.

In terms of logistics enterprise cost, the former logistics enterprise cost problem is mainly extracted, the current situation of modern logistics enterprises is analyzed, and a comprehensive logistics cost status is proposed. The current situation of warehousing cost control of logistics enterprises is not analyzed separately, and there is no in-depth understanding of the research to put forward practical problems and targeted improvement countermeasures.

Secondly, the combing and summarizing of the research results of warehouse management, expounding the relevant theories of warehouse management, applying CVA classification and ABC classification methods, 5S on-site management methods, visual management methods and other methods, all provide non-third-party company warehouse management improvement, mostly prefer to borrow the Internet platform to study non-third-party company warehouse management. In terms of material classification, on the basis of ABC-based classification, advanced warehouse management methods such as genetic algorithm classification, decision tree classification, and AHP-based classification are also proposed. In the warehouse management system, MRP and ERP have been very mature in various enterprises, and the development is also very rapid; Foreign on-site management has theoretical and practical research related to 5S management, Kanban management, visual management, etc., and it is also quite successful in

practical application.

(3) Research ideas and main research content

The warehousing cost control is analyzed according to the actual data of the company, and the specific research is carried out on the warehousing cost control of Z Logistics Company.

Z Logistics Company's warehousing cost composition analysis and cost optimization from the content composition and control of two parts According to the principle of warehousing cost composition, ABC and other classification methods are used to subdivide the content of each part of its company's warehousing cost, on the basis of reading relevant literature, first use the activity cost method and other related methods to study and optimize the cost content structure, and then through the use of 5S Other methods to optimize other aspects of warehousing cost control and management, comprehensive analysis of internal and external parts of Z logistics warehousing cost, and a relatively complete logistics warehousing cost optimization strategy is planned.

Comprehensive evaluation of logistics and warehousing cost optimization capabilities of Z logistics enterprises. Using peer benchmarking comparison + fuzzy comprehensive evaluation method, the evaluation model of logistics warehousing cost of Z logistics enterprise was constructed, the index data collection and processing were collected, and a comprehensive evaluation was carried out, and some constructive strategies and methods that could be adhered to were put forward according to the evaluation results to analyze the optimization progress of the company's logistics warehousing cost.

(4) Research methods and technical routes

Using ABC classification combination method, 5S on-site management method and other methods, the cost optimization strategy of third-party companies in warehousing management is provided by taking Z Express logistics warehousing cost optimization as an example. Secondly, cost optimization is carried out from the two contents of Z Express logistics warehousing cost structure adjustment and management cost control. Secondly, using peer benchmarking comparison, the optimization strategy proposed above is supplemented and evaluated, and the fuzzy comprehensive evaluation method is used to evaluate the cost control of warehouse storage in the proposed solution to the logistics cost of enterprises, so as to understand the relevant information and better reduce the cost.

This paper adopts a theoretical analysis method to analyze the control of warehousing costs. According to the actual data of Z Logistics Company in recent years, the specific research on warehousing cost control was carried out. The technical route of this paper is shown in Figure 1:

2. The Relevant Theoretical Basis

(1) Overview of warehousing for logistics companies

Mainly in the distribution of goods, through the rational use of warehousing resources, to achieve effective distribution of various goods. No longer a simple management job, but a series of management activities.

(2) The specific content of warehousing of logistics enterprises

The definition of warehousing cost is the monetary performance of the sum of living labor and materialized labor that occur in the process of warehousing operations of enterprises, and the various expenses incurred with the actual progress of warehousing operations. According to the requirements of warehouse system layout design to determine

the management mode of the warehouse, if it is a cost center, most of them are aimed at operating costs and service quality, and constantly reduce inventory or even zero inventory; In the case of profit centers, in addition to the operating costs and service quality mentioned in the cost center, more attention is paid to profits.

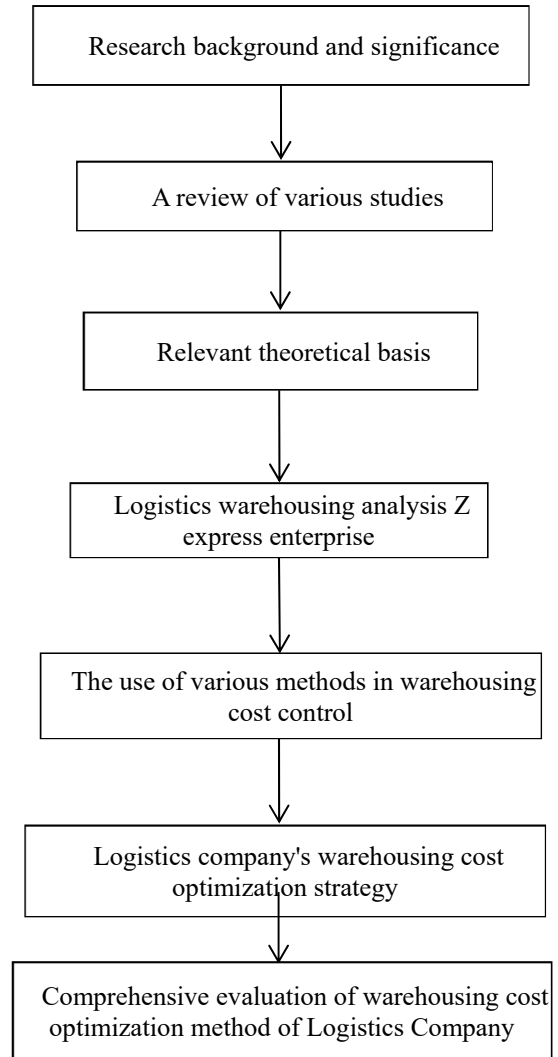


Figure 1. Technology roadmap

(3) Activity costing

Activity cost analysis method is also known as ABC cost method, activity cost calculation method, etc. It is defined as a method of continuously improving the management level of enterprises by identifying and measuring the cost of operations to improve the effectiveness of the entire process from decision-making to control and planning.

When calculating the cost of a product, the job that produces the product is categorized in the unit of calculation, and the cost in each activity stage is calculated. Finally, the final cost is added to the cost in each job.

With the in-depth development of the logistics industry and the increasingly fierce market competition, the supplier of logistics services began to have some opinions on the price and corresponding quality of services, so that the pressure on various enterprises is increasing. The traditional wood control method is no longer suitable for the development of enterprises, and it has many shortcomings, so the activity costing method has become an inevitable method used in various industries.

Combined with the above analysis of the characteristics of

logistics warehousing. The feasibility analysis of the use of activity costing method in the warehousing management of logistics enterprises can be carried out from the following two aspects: 1. The theoretical research of activity costing method is rich. Academic talents from all walks of life have continuously improved their relevant theoretical knowledge and continuously shown their effects in practical application. Then practice shows that the implementation of this method of logistics enterprises is feasible. 2. The idea of logistics warehousing management mode and operation method is similar. After adopting the activity costing method, the factors that cause the change in warehousing cost are scientifically analyzed, and the total cost of warehousing with reference nature is produced, so as to reasonably allocate various indirect costs in the later stage.

3. Research on the Cost of Express Warehousing In

(1) Current situation of Z Express

Z Express Service Co., Ltd. was founded in 2002. As a third-party material flow company in the provincial capital, it has total assets of 400 million yuan and total liabilities of more than 50 million yuan. The company has more than 400 employees and 7 departments: personnel department, finance department, operation department and warehousing department. The company is mainly engaged in the organization of entrusted logistics business, the transportation business is responsible for the external fleet with transportation qualifications, the loading and unloading handling business employs external porters to complete, the company in addition to 7 own warehouses, there are other areas to lease 5 warehouses, another 40 vehicles 10t forklifts and 166 trucks.

Z Express mostly focuses on transportation and other aspects, and does not invest too much energy in warehousing, and the company naturally does not pay too much attention to the problem of warehousing management. Therefore, the understanding of warehouse management by internal personnel is relatively weak and superficial. Without a standardized warehousing operation process, each warehousing operator has no standard indicators and systems for implementation, does not form a unified consciousness, and the cooperation of each personnel is too low, resulting in a decrease in the efficiency of warehousing and an indirect increase in warehousing costs.

Warehouse automation and low degree of informatization

Z Express is a larger third-party logistics enterprise, some warehousing handout equipment strength is insufficient, mechanization and automation degree is low, did not purchase advanced domestic and foreign warehousing equipment, together with the overall informatization backward, mostly manual-based, and finally because there is no first-class assembly line equipment for warehousing work, resulting in too low warehouse management efficiency, indirectly resulting in increased warehousing costs.

Z Express enterprise has deeper assets and more storage points, but most of them are of different scale, the company's senior management only relies on personal judgment and previous experience for decision-making and development, blindly developing surrounding warehouse points such as the

city center, ignoring other surrounding warehouse points, and finally most of the funds flow into individual storage warehouses, resulting in a large gap in the development level of each storage point. It is beneficial to improve the efficiency of the overall storage process. Secondly, the analysis of warehouse cost structure is not clear, advanced warehouse management technology and methods are not learned and cited, the internal structure of the increase in the total cost of each warehouse is vague, and the internal structure of storage cost cannot be adjusted to achieve the purpose of reducing costs. Then the flow and storage capacity of goods is large, and many goods are stored because they are not divided into storage areas according to the characteristics of the goods, the distance between each warehouse point and the storage volume. This leads to problems such as low space utilization, low timeliness, and high error. And in the warehousing process, inventory management, cargo transportation, goods packaging, most of them are still manual operations, not only increase a lot of labor costs, but also increase time, error rate and accident rate is too high to lead to low storage efficiency and increase storage costs.

China's logistics industry started relatively late, Z Express was established in 2002, more than ten years of development, high-tech and highly educated warehousing staff are still in the form of a lack of form, the company's overall specialization is not high, the technical literacy of employees is uneven, and the two-level weathering is more serious.

(2) Z Express logistics warehousing cost optimization

The expenses related to the warehousing cost of Z Express logistics were analyzed item by item, and the warehousing cost was set as warehousing cost - labor cost, warehousing operation - general expenses, warehousing cost - maintenance fee according to the ABC classification method, and the warehousing cost was analyzed from these three points. Among them, the analysis of warehousing costs of Z Express logistics in 2022 is shown in Table 1.

According to accounting details, accounting vouchers, original vouchers and other relevant information. The costs related to table 1 are analysed against the activity costing methodology.

1) Storage cost - labor cost

For sales expenses - salary 52345292.89 yuan, which is the labor cost consumed by logistics management departments such as operation capital, security department, customer service department, etc. The number of staff in the warehouse department is 56, and the salary for the whole year is 3,360,000 yuan, and the rest is the salary expenses of other logistics management personnel. The total number of drivers in the company is 23, and the salary for the whole year is 1,104,000 yuan. This year, the working hours of warehouse operators for warehouse storage, financial management, loading and unloading, handling and packaging were 7670h, 3340h and 5860h respectively. Based on the distribution of staff salary costs according to different working hours, the ratio of custodial working time to total working time in warehousing work is 0.4547.

It is concluded that the labor cost of warehousing work is 1527635 yuan, and the final calculation result is counted in the relevant records: logistics cost - storage cost - labor cost is 1527635 yuan.

Table 1. Classification of warehousing costs and logistics costs (unit: yuan).

Cost expense accounts and line items	Occurrence amount	Whether with logistics	
		Warehousing costs are related(Y/N)	remark
Sales expenses salary	52345292.89	Y	Operation Department, Security Department, Customer Service Department, etc
Sales expenses: Office expenses	7433423.24	Y	Operation Department, Security Department, Customer Service Department, etc
Sales expenses: travel expenses	10609061.31	Y	Operation Department, Security Department, Customer Service Department, etc
Sales expenses: amortization expenses	12315764.19	Y	Amortization of warehouse repair expenses
Sales expenses: depreciated expenses	6834332.55	Y	Truck forklifts, owned warehouse trucks and computers
Sales expenses: rent property	20121078.32	Y	It is mainly for the office rent of the property management department and the utility fee of the warehouse

2) Warehousing operations - general expenses

For sales expenses - office expenses of 7,433,423.24 yuan, which is the office expenses consumed by logistics management departments such as the operation capital, security department, customer service department, etc., the number of office supplies used for warehouse collection is about 16,909, and the number of pieces used by other departments 340232 pieces Office expenses are distributed according to different quantity proportions, and the proportion of office products in the warehousing department to the total number of office products is 0.04735. Warehousing operations – office expenses are 351939 yuan.

For sales expenses - travel expenses of 10,609,061.31 yuan, which is the total travel expenses of the logistics management department, based on the average travel expenses, the number of reimbursements by the warehousing department is 379 times, and the rest of the departments are 4621, The proportion of travel expenses and financial reimbursements was allocated, and the proportion of reimbursements from the warehousing department to the total number of reimbursements was 0.07575 Warehousing operations – Travel expenses are 803685 yuan.

Warehousing operation - general expenses = warehousing operation - office expenses + warehousing operation - travel expenses are 1155624 yuan

3) Storage cost - maintenance fee

For maintenance costs - depreciation cost 6834332.55 yuan, which is the total depreciation cost of logistics management departments such as operation capital, security department, customer service department, etc., the total cost of warehouse

facilities and equipment is 10245259 yuan, and the total cost of facilities of other departments is 40382376 yuan, depreciation expenses are distributed according to the original different total prices of each facility and equipment, and the ratio of the total cost of facilities and equipment in the warehousing department to the total cost of facilities and equipment is 0.2023. Storage cost - maintenance fee - depreciation expense is 1383029 yuan.

For maintenance costs - property fees, use the rent property 20121078.32 yuan. For the examination of the proof of expenses, the property fee is composed of the utility fee of the office space leased warehouse of each department, and the amounts are 15437967.76 yuan and 4633110.56 yuan respectively. Recorded in the relevant record table: logistics cost - warehousing cost - maintenance fee is 4633110.56 yuan. For maintenance fees - amortization fee of 12,315,764.19 yuan, which is the total maintenance cost of the warehousing department.

Storage cost - maintenance fee is property fee + depreciation expense + amortization expense is 7,247,703.75 yuan.

4) Total cost of warehousing

From the above calculation data, it is concluded that the total cost of warehousing in 2022 = warehousing cost - labor cost + warehousing operation - general expenses + warehousing cost - Maintenance fee + storage cost - amortization fee is 21015162.75 yuan.

According to the same algorithm, the various data for 2021 and 2020 are calculated as shown in Table 2.

Table 2. Analysis of the company's logistics cost in the past 3 years (unit: total - yuan, year-on-year-%).

Cost items		Total for 2020	2021 totals	Total for 2022	In 2020	In 2021	In 2022
Logistics function costs	Warehousing costs	19239368.99	16451584.43	21015162.75	100%	85.51%	109.23%
	total	8945345.89	7543871.91	9372933.42	100%	84.4%	104.78%
Total logistics costs		10234353	8474044.28	1063276.07	100%	82.2%	103.14%

According to Table 3-2, the total cost of logistics decreased in 21 years for the three years of 2020, 2021 and 2022. It was added again in 22 years. The cost of logistics functions decreased in 21 years and increased in 22 years. The trend pattern is similar to the two.

For the actual data analysis, the change of logistics function

cost has a great impact on the change of total logistics cost and plays a decisive role. Further analyze the warehousing cost in the logistics function cost, and analyze the internal structure of the warehousing cost in depth, and make the summary table 3 of the cost information of the warehousing payment form.

Table 3. Summary table of storage payment form cost information (unit: yuan).

			In 2020	In 2021	In 2022
Warehousing costs	Self-operated	Labor costs	1398955	1401221	1527635
		Maintenance fees	7297901	6899989	7247703.75
		General Fees	878578	892456	900789
		total	9575434	9193666	9676127.75

According to Table 3, the internal structure of storage costs of Z Express enterprise in the past three years is further analyzed, and the trend changes of each part are further

analyzed, and the year-on-year analysis table is shown in Table 4.

Table 4. Cost trend analysis table of warehousing payment pattern (unit: %).

			In 2020	In 2021	In 2022
Warehousing costs	Self-operated	Labor costs	100	100.21	109.02
		Maintenance fees	100	94.54	105.04
		General Fees	100	101.58	100.93
		total	100	96.01	105.25

The company's warehousing costs have shown a trend of first declining and then rising in three years, analyzing the three major parts of its warehousing costs, the cost of maintenance costs in 2021 fell by 6 percentage points, the difference between labor costs was small and basically flattened, and the general cost was close to 1 percentage point increase. In 2022, maintenance costs increased by 11 percentage points and labor costs increased by 9 percentage points. The general cost base is small and the two-year variable is small. Labor costs are in the middle, with small changes in 21 years and large changes in 22 years. The maintenance fee base is relatively large, and the two-year variable is also large. Finally, the overall storage cost decreased by 4 percentage points in 2021 and increased by 14 percentage points in 2022.

The reason is that the scale of the enterprise has expanded in two years, but the total cost of warehousing has decreased in 2021, mainly because the maintenance fee of that year has decreased significantly, and the maintenance cost management of the year should be analyzed to find out the reasons and learn from it. Moreover, the fluctuation of maintenance fees in the past two years has fluctuated greatly, which shows that there is great potential for reducing maintenance costs.

Therefore, it is necessary to reduce storage costs, and we should start from the important point of maintenance fees, and then carry out other aspects. Maintenance fee mainly consists

of three parts: property fee, depreciation fee, amortization fee, property fee can be paid according to the long-term annual fee and advocate energy conservation for cost control, amortization fee This part can choose professional companies for long-term cooperation for cost control. In terms of general expenses, office expenses can be reduced by bidding to find companies with lower prices and long-term cooperation; In terms of travel expenses, the form of personal reimbursement can be canceled first, and then unified arrangement and scheduling can be carried out after the analysis of business travel routes and other aspects within the company, and the systematic expenses will be reduced, and the differential travel expenses brought by other personal factors will also be reduced, thereby reducing storage costs.

(3) Optimization of storage cost content control

In the early stage, the internal composition of warehousing costs is analyzed and optimized, and secondly, the external control of warehousing cost content needs to be optimized.

Z Express enterprise should not focus on the transportation part of logistics, but also should pay attention to the part of warehousing management, the company's departments to carry out staff meetings, focus on the importance of warehousing management, encourage everyone and the company to pay attention to all aspects of the warehousing management process, warehousing staff should carefully investigate and record each link of warehousing operations, good at finding problems from the details, timely feedback

and deal with the problems.

There is an urgent shortage of senior professionals within the company, and there are many medium and basic staff. First of all, the company should select a group of employees with development potential from the actual situation to carry out professional training and further study as the cultivation of high-tech talents; Secondly, hire outstanding talents in the same industry under the condition of high salary and welfare protection, and give preferential treatment to long-term development prospects; Finally, enterprise-school cooperation, cooperation with universities, starting from college students for the company's targeted talent training.

At present, the current situation of the company is more artificial than automated, and the level of informatization is still very low. We should learn from other excellent enterprises, and introduce some cost-effective and practical advanced facilities and equipment at home and abroad according to the actual situation of the company, such as: electric forklifts, conveyor belts, intelligent robots, etc., and be equipped with professional talents who are proficient in each equipment.

Use 5S management method for warehousing cost control. In terms of layout design, the inventory area is reasonably divided. According to the characteristics of the stored goods, the storage area is divided according to the storage volume, but with the influence of market changes such as season, trend, and region, the demand for each region's location changes randomly. The warehouse can leave a few small areas to stack goods that cannot be stored under the change, and be specially

managed by employees with relevant expertise and reported at any time.

4. Comprehensive Evaluation of Z Express Logistics Warehousing Cost Optimization

The above part solves the problem of logistics warehousing cost of Z Express from the content composition and external control, and cannot judge the feasibility of the solution in the sense of competence. Peer benchmarking and fuzzy comprehensive evaluation methods will be used to supplement the objective judgment and comprehensiveness of optimization planning, and effective warehousing cost reduction will be carried out from as many aspects as possible.

(1) Peer benchmarking comparison

Benchmarking is divided into three ways: internal, external, and internal and external synthesis. Peer benchmarking is an intra-industry benchmarking comparison of external benchmarking. This means comparing a company's financial strategies and processes within a related industry.

Using the benchmark comparison in the industry, the warehousing management aspects of SF, Best and Z are compared, the differences and differences between Z Express and the other two enterprises are analyzed, and the feasibility and certainty of the warehousing cost optimization strategy proposed in the previous part are objectively judged, see Table 5 for specific comparison

Table 5. Benchmark comparison of warehouse management of three third-party material enterprises

enterprise	Pay attention to the degree of success	Automation and informatization	Management methods	Talent aspect
S.F. Express	The concept of SF warehouse allocation was proposed, which refers to abandoning the previous single warehouse model and accepting the modern cloud warehouse model.	Maintain the basis of existing technology and use the most advanced Information and logistics technology, strengthen research and development.	Flexible warehousing, national distribution, scientific allocation, easy and efficient, exclusive customer service, pay attention to consumer experience	Logistics talent team construction with professional knowledge; High professional quality of internal junior staff
Best delivery company	Best has experienced rapid development in the early days, and now it has reached a bottleneck period. Eyes gradually turned to warehouse management in search of greater profits.	The awareness of e-commerce informatization construction is not enough, and the resource investment is not very large, which restricts the improvement of enterprise services.	Adopt a franchise system and quickly build a nationwide network. But the disadvantages of the franchise system are day Positive manifestation.	Most of its staff are basic workers and have little knowledge of professional knowledge. The personnel turnover is large, and the service attitude is not good.
Pass Express	Pay attention to transportation and other aspects, not to warehouse management.	The handout equipment in warehousing is insufficient, and the degree of mechanization and automation is low.	The company's senior management relies on personal experience to make decisions and development, and blindly develops. Advanced warehouse management technologies and methods are not learned and referenced, and there is no storage area divided by characteristics.	There is a lack of high-tech and highly educated warehousing staff, the company's overall specialization is not high, the technical literacy of employees is uneven, and the weathering of the two levels is more serious.

Comparing the three, we can know that SF Express is in the development of the former, Best Express belongs to the middle, then Z Express is relatively backward, there is still a lot of room for development, should learn from the good aspects of the first two. The optimization strategy that should be carried out from the four parts of this warehouse management division is obtained, and the above analysis content is based on the countermeasures of Z Express logistics warehousing, which lacks the learning of the successful experience and failure lessons of excellent peer enterprises. There are the following additions:

Z Express enterprise should pay attention to the part of warehousing management, just as Best Express gradually starts from warehousing management in terms of reducing costs, and finally reaches the height of SF Express to form a warehousing model suitable for its own development.

It should start from three aspects, internal training, external training, and all-round introduction to improve the comprehensive strength of the company's talent team.

Introduce advanced facilities and equipment, and equip technical personnel for related operations; Strengthen its own network information retrieval to improve the company's operation efficiency and work quality.

Explore the warehouse management model suitable for their own development, and constantly innovate and improve, keep pace with the times, and match the management mode with the company's development process.

(2) Fuzzy comprehensive evaluation method

Starting from the four existing problems of too low attention to warehousing management, low degree of automation and informatization, backward warehousing management methods, and lack of warehousing talents, the above article uses the operation cost method to analyze the situation in the past 3 years from the internal composition of warehousing costs in warehousing management, it is concluded that it can be settled from the cost the direction of

component cost reduction; Subsequently, the peer benchmarking comparison method was selected, and other enterprises in the industry were compared in these four aspects, learning the excellent practices of excellent industries, learning some problems and lessons from other industries, and making more subdivided and comprehensive objective strategies for warehouse cost optimization.

It is necessary to make a certain comprehensive consideration of whether the four optimization strategies carried out in the early stage can solve the problem of excessive storage costs. The fuzzy comprehensive evaluation method should be used to objectively evaluate the optimization strategy of Z logistics warehousing cost control, avoid the problem of subjective awareness, and prove the desirability and practicality of the above scheme.

The following uses the fuzzy comprehensive evaluation method to objectively evaluate and analyze the optimization strategy above:

According to the optimization strategy to solve the storage cost above, the evaluation index set is subdivided hierarchically. The set of indicators is $U = \{U_1, U_2, U_3, U_4\}$ indicating that the evaluation results are composed of 4 factors. They are the degree of attention to warehouse management, the degree of automation and informatization, the method of warehouse management, and the degree of warehousing talents.

Let the set $V = \{V_1, V_2, \dots, V_m\}$, m to represent the number of ratings of evaluations. This article sets the comment set to have 4 levels, that is, the performance is $V = \{\text{excellent, good, medium, poor}\}$, Assign points defined as: 4, 3, 2, 1.

Before the fuzzy comprehensive evaluation method can be carried out, the weights at all levels need to be determined. The subjective weighting class of the analytic hierarchy (AHP) is chosen to determine each weight. The judgment matrix for constructing these four criteria is shown in Table 6.

Table 6. Judgment matrix

	Warehouse management attention	Degree of automation and informatization	Warehouse management methods	Warehousing talent
Warehouse management attention	1	2	4	3
Degree of automation and informatization	1/2	1	2	1
Warehouse management methods	1/4	1/2	1	1/2
Warehousing talent	1/3	1	2	1

W_i represents the relative weight of the comparison of two features.

It is generally calculated using the square root method:

$$W_i = \frac{1}{\sqrt{n}} \sqrt{\prod_{j=1}^n a_{ij}} \quad (1)$$

The result is:

$$W_i = (W_1, W_2, W_3, W_4) = (2.2134, 1, 0.5, 4.621) \quad (2)$$

W_i' as a W_i relative weight after normalization. The calculation formula is:

$$W_i' = W_i / \sum_{i=1}^n W_i \quad (3)$$

The result is:

$$W' = (W_1', W_2', W_3', W_4') = (0.4734, 0.2166, 0.1083, 0.1957) \quad (4)$$

The calculation formula is

$$\lambda_{\max} = \frac{1}{n} \sum_{i=1}^n \frac{(BW)_i}{W_i} \quad (5)$$

$$BW_i = \sum_{i=1}^n a_i * W_i \quad (6)$$

The result is:

$$BW=(BW_1, BW_2, BW_3, BW_4)=(1.9272, 0.8656, 0.4328, 0.7864) \quad (7)$$

$$\lambda_{\max}=4.0209 \quad (8)$$

Conduct consistency inspection.

$$C.I.=(-n)\lambda_{\max}/(n-1) \quad (9)$$

The consistency ratio is:

$$C.R.=C.I./R.I. \quad (10)$$

The result is:

$$C.I.=0.00697 \quad (11)$$

Looking at the list of average consistency indicators 7, we get that R.I. = 0.89 at this time.

n	1	3	4	5	6	7	8	9
R.I.	0	0.52	0.89	1.12	1.26	1.36	1.41	1.46

The result is:

$$C.R.=0.00783 < 0.1 \quad (12)$$

The calculated weights are reasonable, so the relative weights calculated above W_i' as normalized W_i can be directly used in this fuzzy comprehensive evaluation.

$$W_i' = (0.4734, 0.2166, 0.1083, 0.1957) \quad (13)$$

Determination of the judging matrix.

According to the set V, the single-factor membership matrix R:, obtained by expert evaluation

$$R = \begin{bmatrix} 0.6, 0.3, 0.1, 0 \\ 0.5, 0.4, 0.1, 0 \\ 0.7, 0.2, 0, 0.1 \\ 0.5, 0.2, 0.2, 0.1 \end{bmatrix} \quad (14)$$

The table of index weights is synthesized, as shown in Table 4.

Table 8. Table of indicator weights

	weight	excellent	good	middle	difference
Warehouse management attention	0.4734	0.6	0.3	0.1	0
Degree of automation and informatization	0.2166	0.5	0.4	0.1	0
Warehouse management methods	0.1083	0.7	0.2	0	0.1
Warehousing talent	0.1957	0.5	0.2	0.2	0.1

(3) Fuzzy matrix calculation.

Make a comprehensive evaluation of the indicators.

The result is:

$$B = W_i' * R \quad (15)$$

$$P=3.3791 \quad (18)$$

The result is:

$$B = (0.566, 0.28946, 0.10814, 0.0304) \quad (16)$$

The final result of the evaluation was 3.3791, which is between [3,4]. According to the judge, the score is worth the range of "good", and it is concluded that the comprehensive evaluation result of Z Express on the cost control results of logistics warehousing is good.

Summary of fuzzy comprehensive evaluation method

The use of fuzzy comprehensive evaluation method makes an objective evaluation of the optimization and protection of logistics and warehousing costs of enterprises. According to the results of the evaluation, problems in the internal

Calculate the overall score.

$$P = V * B^T \quad (17)$$

refinement of the company's logistics and warehousing cost control can also be found, and relevant problems can be solved in time. Reduce warehousing costs and indirectly increase the company's profit acquisition. Finally, the results are good, and it is concluded that warehousing cost control from these four aspects has a certain feasibility and significance.

5. Policy Recommendations

Some new problems have emerged in the development of the logistics industry, and the problems in warehouse management are particularly prominent. In the future, China will vigorously develop third-party logistics enterprises, establish a modern logistics service system, and introduce various relevant policies. The development of warehousing management in the logistics supply chain is relatively slow, although a certain standardization of logistics warehousing has been established and a set of more systematic logistics warehousing laws has been formed, but now some systems are no longer suitable for the development of warehousing management of third-party logistics enterprises, and it is necessary to continuously standardize relevant rules and regulations and propose laws and policies that adapt to modern society. The following recommendations are made:

Cultivate logistics and warehousing professionals. Establish a complete set of logistics warehousing education and training system, comprehensively and deeply study warehousing management issues, cultivate outstanding talents who master the basic knowledge of logistics warehousing of third-party enterprises and are proficient in various warehousing management technologies, and cultivate talents who meet the needs of modern logistics warehousing from both theoretical and operational aspects.

Increase and strictly control the number of logistics warehousing standards. Encourage the establishment of standardized warehousing in many aspects, and then form the socialization of logistics warehousing services. However, when setting up standardized warehousing, relevant provisions should be added from the aspects of operation specifications, management, and service quality. Improve the service and management level of logistics warehousing, and fully support the implementation of logistics warehousing standardization.

Vigorously promote the standardization of logistics and warehousing to all members of the society. Through the vast number of media, expand the communication channels, comprehensively popularize the relevant basic knowledge and technical methods of material warehousing standardization, deeply influence the service awareness and means of third-party logistics enterprises, and recognize the implementation of warehousing standardization from the heart.

For the above suggestions, it is hoped that the China Warehousing Association can improve and improve the policy from these three aspects, lead third-party logistics enterprises to respond to the implementation of logistics warehousing standardization, and provide channels and departments for training and consulting on warehousing standards with the support of the National Standards Committee and the National Logistics Standards Committee, so that China's logistics warehousing standardization can reach a higher level.

6. Conclusion and Outlook

At present, the logistics industry is developing rapidly, and the competition between enterprises is becoming more and more fierce. If enterprises want to have a certain position and appeal power in the market, they should not only strengthen construction in logistics transportation and distribution, but also pay attention to warehousing management.

This paper analyzes the current situation of logistics warehousing in Z Express, analyzes the reasons for the high storage cost of the enterprise in the past three years, and obtains four existing warehousing problems of the enterprise, and conducts in-depth research from two aspects: the internal composition of warehousing cost and external control analyzes internal factors and external influences.

In the internal composition of warehousing, the activity cost method is selected and used, according to the details of the storage cost account details, the internal components of the warehousing cost are analyzed, and the results of the past 3 years are compared, so as to obtain the reasons for the increase in warehousing costs, learn the lessons of these three years and learn the part that has been done well, from the important point of maintenance costs Start first, and then control general expenses from other aspects. In terms of four optimization strategies for external problems: improve the degree of attention, improve automation, informatization, improve management methods, and introduce talents, and use the peer benchmarking comparison method in the benchmarking comparison to supplement the optimization methods comprehensively and in detail, Z Express, SF Express and Best Huitong Third-party logistics companies carried out comparative analysis, so that Z Express learned from the excellent practices of other enterprises and supplemented some methods and strategies. Finally, the above optimization strategy is objectively evaluated by using the fuzzy comprehensive evaluation method, and it is concluded that the optimization strategy is good and can better control the logistics and warehousing costs of Z.

Finally, this paper puts forward some policy suggestions for logistics warehousing in China, hoping to improve the requirements of standardized logistics enterprise warehousing system. Better promote the development of logistics enterprises, and then promote the development of China's logistics industry.

References

- [1] WANG Feifei, YE Yong, LI Pengfei, ZHENG Mingming Empirical study on logistics warehousing operation cost[J]. Logistics Technology. 2009,11:223-224.
- [2] GAO Yanjiao. Research on cost control of logistics enterprises[D]. Jingdezhen Ceramics Institute.2014.
- [3] XUE Xinyun, FU Shaochuan Application of operation costing method in logistics costing under constraints[J]. Logistical.2009,04:73-76.
- [4] LIU Rongye, QIU Renyi Multi-level fuzzy comprehensive evaluation of enterprise logistics cost control ability[J]. Transportation Technology and Economics.2008,02: 91-93.
- [5] QIN Dongfang, WANG Haiyuan Analysis of influencing factors of supply chain cost quota[J]. Mall modernization. 2009,04: 145.
- [6] HUANG Xiangmin, LIU Dacheng, ZHOU Yangfang Frontiers and Progress of Foreign Logistics Cost Research: A Literature Review[J]. Business Research 2006,23: 203-209.

- [7] BAI Weidong. Research on logistics and warehousing costs of small and medium-sized enterprises[J] SME Management and Technology (Mid-Period).2014,12: 39-40.
- [8] GUO Shanshan. Analysis on warehousing management mode of logistics enterprises in small and medium-sized cities[J]. Business Economics. 2011,22: 34-35.
- [9] ZHANG Jinjing. Research on warehousing cost control of S logistics Co., Ltd.[D]. Tianjin University.2014.
- [10] YAN Xiaolan, XIONG Changshun Discussion on warehousing cost control of small and medium-sized logistics enterprises[J]. Transportation Enterprise Management.2013,10:57-58.
- [11] MA Jie,HU Yi Benchmarking comparison in the transformation of finance function [J]. Shandong Textile Economy. 2005,6:4.
- [12] PENG Xinlian. Optimization of logistics warehousing business based on RFID technology[J]. Hengyang Technician College. Mall Modernization.2022, 16: 35-36.