



**Study on the quality improvement of flower transportation service
of SC airlines**

Rui Yi Li

Haaga-Helia University of Applied Sciences

Haaga-Helia Bachelor's Degree

Bachelor's Thesis

2023

Abstract

Author(s) Rui Yi Li
Degree Bachelor of Airline Business
Report/Thesis Title Study on the quality improvement of flower transportation service of SC airlines
Number of pages and appendix pages 26+ 0
<p>With the rapid development of China's economy and the continuous improvement of people's living standard, flower consumption is growing year by year. As one of the largest private airlines in southwest China, SC Airlines has been paying much attention to its flower transportation service. However, the quality control of flower transportation service is difficult due to the fact that the flowers themselves are susceptible to the environment and there are many factors to be considered during the flower transportation process, such as temperature, humidity, oxygen content and so on. At the same time, due to the fierce competition in the market, many airlines have joined the flower transportation field, so SC airlines need to continuously improve their flower transportation services to maintain their competitive advantage.</p> <p>The purpose of this study is to explore the methods to improve the quality of flower transportation services of SC airlines. Through the investigation and analysis of the current situation of flower transportation services of SC airlines, it is found that there are problems such as unstable service quality, lack of means of evaluation, and lack of standard service quality evaluation system. In order to solve these problems, this study puts forward the following suggestions: first, enriching and improving service products, including developing new service products, optimizing existing products, and improving service quality under strict control; second, optimizing technical support for air transportation of flower transportation, shortening transportation time and improving service quality by establishing an efficient logistics network; third, information platform and management maintenance; fourth, customizing services to improve customer satisfaction. The recommendations of this study can provide useful references for SC airlines to improve the service quality of flower transportation.</p>
Key words Flower transportation, SC airlines, service quality, strategy

Table of contents

1 Introduction	1
1.1 Research Background	1
1.2 Research significance	2
1.3 Current status of research	3
1.3.1 Current status of domestic research	3
1.3.2 Status of foreign research	5
1.4 Research Methodology	5
1.4.1 Literature research method	5
1.4.2 Case study method	6
1.4.3 Hierarchical analysis method	6
2 SC airlines flower transportation service quality status	7
2.1 The current situation and problems of flower transportation service of SC airlines	8
2.1.1 Lack of means of evaluation	9
2.1.2 Lack of a standard service quality evaluation system	9
3 Three principles and steps of hierarchical analysis	11
4 Construction of the indicator system	12
4.1 Correlation analysis	14
4.2 Importance of indicators in order	14
4.3 Consistency test	15
4.4 Comprehensive evaluation results	15
5 Model construction and empirical analysis	17
6 SC airlines flower transportation service quality improvement strategy	18
6.1 To enrich and improve the service products	18
6.1.1 Develop new products	18
6.1.2 Optimize the original product	19
6.1.3 Improve service quality	19
6.2 Update air transport technical support	20
6.3 Information technology platform and management and maintenance	23
6.3.1 Passenger Service System	23
6.3.2 Information Management System	23
6.3.3 Customized services	24
7 Conclusion	25
Sources	26

1 Introduction

With people's pursuit of quality of life, flowers have gradually become an indispensable part of people's daily life. At the same time, the global trade of flowers has shown a steady growth trend. According to statistics, the total size of the global flower market reached USD 240 billion in 2019, and is expected to maintain growth in the coming years. Airline is an extremely important part of the modern logistics industry, and its service quality is directly related to customer satisfaction and market competitiveness. With the improvement of people's quality of life and the expansion of the flower consumption market, the demand for flower transportation is also increasing. The traditional land transportation method is limited by time and distance, which can't meet today's demand of efficient, fast and safe logistics. In contrast, air transportation has the advantages of fast speed, wide range, safe and reliable transportation, which is especially suitable for the transportation of high value, perishable and perishable items such as flowers.(Li Wei 2022)

1.1 Research Background

In such a background, airlines have become one of the main channels for flower transportation. Due to its fast and efficient characteristics, more and more flower traders start to choose to use airlines for flower transportation. However, in the flower transportation service, there are often problems such as long transportation time and improper temperature control, which lead to high loss rate of flowers. Therefore, how to improve the quality of airlines' flower transportation service and reduce the loss rate of flowers has become an urgent problem in the current flower trade market. However, in actual operation, airlines' flower transportation service faces many challenges. Firstly, the freshness period of flowers is very short, and they need to be transported as soon as possible within a short period of time, otherwise they will be wilted and discolored. Secondly, flowers are generally high-value goods, which need special attention to cargo safety and insurance protection. Secondly, different varieties of flowers need different temperature and humidity environments, which need to be finely managed and controlled. Thirdly, airlines need to provide different transportation solutions, prices and services according to market demand and customer requirements to meet the diversified needs of customers. Sichuan Airlines, as an international airline, has a certain market share and advantage in the transportation of flowers. However, there is no study on the quality improvement of flower transportation service for this airline. sc airlines is one of the leading cargo airlines in the world and also has rich experience in flower transportation. Due to the fierce competition in the market, SC Airlines needs to continuously improve the quality of its flower transportation service to meet customer demand and increase its market share. Therefore, this thesis will discuss how to improve the quality of flower transportation service of SC

Airlines by improving the transportation process, improving the quality of employees and using modern technology.(Cui Mengya 2022)

1.2 Research significance

Sichuan Airlines is one of the leading airlines in China, offering domestic and international flight services. As a modern airline, it is actively promoting the quality of flower transportation services. Sichuan Airlines, as a major airline, has been committed to providing high quality and efficient services. In the context of the current rapid development of the flower industry worldwide, flower transportation service has become an important part of airline services. Therefore, it is very significant to study the quality improvement of flower transportation service of Sichuan Airlines. In this paper, the author will discuss the significance of this study in detail, in the following aspects.(Zhao Xiaoxi 2021)

First of all, flowers are a very special kind of cargo with high requirements for temperature, humidity, vibration and other conditions. Therefore, it is very important to ensure the safety of its transportation and the stability of its quality. Flowers are a high value-added commodity, and any loss during transportation will bring great dissatisfaction to customers. By improving the quality of flower transportation service, Sichuan Airlines can effectively improve its customer satisfaction and enhance its market competitiveness. For Sichuan Airlines, improving the quality of flower transportation service can improve its market competitiveness. In today's competitive market environment, customers are demanding higher and higher quality of products and services. If Sichuan Airlines can provide high quality flower transportation services, it can get more orders and customers in the market. At the same time, customers' satisfaction with Sichuan Airlines will also increase, which will promote the company's development.(Zhang Lan 2021)

The flower trade is one of the oldest trades in the world and a fast growing industry. It is reported that the global flower trade has reached hundreds of billions of dollars. With the development of China's economy and the improvement of people's living standards, the flower market has also shown an explosive growth trend, which provides Sichuan Airlines with a broad space for development. By improving the quality of flower transportation services and thus broadening the market for the company's transportation. On the one hand, flower transportation has an important economic significance for Sichuan Airlines. In recent years, China's flower market demand is growing, and the quality and freshness of flowers is one of the important factors affecting the sales of flowers. As one of the important channels of flower transportation, the improvement of flower transportation service quality of airlines can greatly improve the efficiency of flower supply chain, enhance the competitiveness of flower sales and promote the healthy development of flower industry.(Wan Lei 2021)

1.3 Current status of research

1.3.1 Current status of domestic research

In recent years, as people's demand for quality of life is increasing, the demand for flowers as gifts and decorations is also getting higher and higher. As one of the main carriers of flower transportation, airlines are paying much attention to the improvement of their flower transportation service quality. The following is a detailed description of the current situation of domestic research.

With the acceleration of globalization and the development of logistics industry, the international trade of flowers is growing year by year. Meanwhile, the demand for flowers as gifts and decorations is also increasing, which requires airlines to provide higher quality flower transportation services. However, the problems of temperature, humidity and pressure in the flower transportation process, as well as the transportation capacity and service level of airlines are important factors that affect the quality of flower transportation services. Therefore, in response to the above problems, domestic scholars and business people have conducted a lot of research and discussion.(Tian Yu 2020)

From the aspect of transportation condition control, transportation condition is one of the key factors affecting the quality of flower transportation. Research shows that suitable transportation temperature and humidity are important conditions to ensure the quality of flowers. At present, domestic airlines have taken a series of transportation condition control measures for the special needs of flowers, such as insulated box and refrigerated cabin, to ensure that the temperature and humidity of flowers in the transportation process meet the standards. Flowers are a highly sensitive commodity, and their storage and transportation conditions have an important impact on the quality and freshness period of flowers. Therefore, the study of the optimization and improvement of flower transportation conditions has been one of the important topics in the flower industry. The transportation methods of flowers include air transportation, land transportation and sea transportation, etc. Different transportation methods have different effects on the freshness period and quality of flowers. Researchers have explored the optimal transportation conditions under different transportation methods by comparing the physiological indexes and appearance quality of flowers under different transportation methods. Some scholars have studied temperature management and concluded that temperature is one of the most important factors affecting the shelf life and quality of flowers. By controlling the transportation conditions under different temperatures, the researchers studied the effects of temperature on the physiological metabolism and appearance quality of flowers, and proposed corresponding transportation temperature management measures. Humidity is also one of the most important factors affecting the shelf life and quality of flowers. The researchers studied the effect of humidity on water evaporation and

wilting of flowers by controlling the transportation conditions under different humidity levels, and proposed the corresponding transportation humidity management measures. Oxygen and carbon dioxide are important gases that affect the physiological metabolism and shelf life of flowers. By adjusting the transportation conditions under different gas concentrations, the researchers investigated the effects of gases on the freshness period and quality of flowers, and proposed corresponding gas management measures. In addition, there are packaging materials, which also have an important influence on the protection and freshness of flowers. The researchers proposed the optimal packaging materials and packaging methods by comparing the transport effects of different packaging materials.(Zhou Hong 2019)

Research on the transportation conditions of flowers mainly focuses on freight methods, temperature management, humidity management, gas management and packaging materials, etc. By exploring the physiological indexes and appearance quality of flowers under different transportation conditions, corresponding transportation management measures are proposed. These research results provide important theoretical and technical support for the sustainable development of the flower industry.

Research on transportation safety and security, flowers are perishable and therefore require special attention to safety and security during transportation. The study shows that airlines need to monitor and control the pressure, vibration and tumbling during the transportation of flowers to avoid damage or deterioration of flowers during the transportation process. At the same time, airlines also need to strengthen the training of packaging and loading and unloading techniques to improve the professional skills of employees to ensure the safe transportation of flowers. In terms of service level improvement, the service level of airlines is also an important factor affecting the quality of flower transportation. Research shows that airlines need to improve their service quality, including providing more convenient flower transportation services, responding to customers' demands quickly and providing quality after-sales services. In addition, airlines need to strengthen communication with customers, understand their needs and opinions, and continuously improve their service quality.(Long Jiling &Liu Guangcai 2018)

With the increasing demand for flower transportation services, airlines need to continuously improve the quality of flower transportation services to meet the needs of customers. Future research directions include: improving the level of transport condition control, researching new insulation box and refrigerated cabin technology; strengthening transport safety and security, researching new packaging technology and loading and unloading technology; improving service level, researching new service model and customer demand management technology. Through

continuous research and innovation, airlines can provide higher quality flower transportation services to meet customers' needs.(Zhao Haotian 2018)

1.3.2 Status of foreign research

In recent years, with the improvement of people's living standard and the demand for quality of life, flowers as an important gift and decoration, its market demand grows year by year. And air transportation, as a fast, efficient and reliable transportation method, has become one of the main ways to transport flowers. Therefore, the improvement of airline flower transportation service quality has become an important research direction.(Liu Ping 2014)

Foreign research shows that the improvement of airline flower transportation service quality mainly includes the following aspects: First, to protect the quality of flowers, airlines should establish a perfect flower transportation management system to ensure that flowers are fully protected in the transportation process and avoid quality problems such as dehydration and discoloration caused by temperature, humidity and pressure. Improve the transportation speed. Airlines should optimize the flower transportation process, strengthen the cooperation with freight agents and air freight companies, improve the logistics efficiency, shorten the flower transportation time, and ensure the flowers can reach the destination in the shortest time. Secondly, provide customized services, airlines should provide different flower transportation services according to customers' needs, including different flights, different class, different temperature, humidity and other requirements, in order to meet customers' individual needs. Third, strengthen customer service, airlines should strengthen customer service awareness and provide high quality services, including timely information feedback, cooperate with customers to deal with problems, etc., in order to improve customer satisfaction and loyalty. Fourth, strengthen the safety management, airlines should strengthen the safety management of flower transportation to ensure that flowers are not lost or contaminated during the transportation process, and avoid the quality of flowers from declining due to safety issues.(Song Yi 2017)

In conclusion, the improvement of airline flower transportation service quality is a complex system project, which requires airlines to improve the system, process, service and safety in all aspects, in order to meet customer demand and improve market competitiveness.

1.4 Research Methodology

1.4.1 Literature research method

After reading and analyzing the literature on air cargo service at home and abroad, we summarized the current research status and evaluation index system of air cargo service and traditional cargo

service, and found a research, analysis and evaluation method applicable to the evaluation of air cargo service quality, and then laid a certain theoretical foundation for the study of cargo service quality of G airlines.

1.4.2 Case study method

This study selects the service quality of flower transportation of SC airlines as the research target, because the airline has a large influence in flower transportation, even in the country, and can reveal the service quality problems faced by SC airlines in flower transportation from different perspectives. And propose relative strategies for the problems.

1.4.3 Hierarchical analysis method

Using the AHP hierarchical analysis method, we analyzed the flower transportation service of SC airlines by combining the actual operation situation of SC airlines, constructed a hierarchy matrix, and obtained the corresponding weights of each index to objectively and comprehensively study the flower transportation service of SC airlines by combining qualitative and quantitative methods.

2 SC airlines flower transportation service quality status

SC Airlines is the second largest cargo destination in mainland China in terms of total cargo volume and total cargo revenue for the fifth consecutive year, with annual cargo revenue of over RMB 700 million in 2021. SC Airlines operates four all-cargo flights per week on the B747-8F, the largest and most loadable cargo aircraft, with a portion of the belly class capacity of passenger flights to serve customers. In terms of organizational structure, SC Airlines Cargo Department has a sales team, a reservation team and a field service team. In terms of ground support, SC Airlines signs a service contract with the airport ground service air cargo terminal, and a third party provides ground operation support, while SC Airlines personnel train, supervise and manage subcontractors according to its own operation system.

In terms of cargo service product design and implementation, SC Airlines has launched various product standards at the headquarters level to meet the different cargo needs of customers, and each branch is responsible for sales and implementation: General Lift is for general cargo without special attributes, with normal time booking according to space availability and general loading priority, which is the cargo service product with the largest share of volume. Priority Lift for priority cargoes, with priority booking and automatic cargo confirmation, express handling for latest delivery and earliest delivery, and priority guarantee in loading. DG Lift offers fully compliant transportation solutions for dangerous goods. Dangerous goods transportation, especially in air cargo, requires the most demanding professional experience and knowledge, and SC Airlines has a team of licensed dangerous goods professionals covering the full range of dangerous goods systems to ensure full compliance with IATA dangerous goods regulations. For fresh cargo, Fresh Lift guarantees the delivery of cargo with rich experience in cold chain management, while ensuring the quality of cargo remains unchanged; Live Animal Lift provides delivery services for live animals; Expert Lift provides professional pre-sales evaluation and cargo packaging and loading design for overweight, oversized and precision shock-absorbing cargo. Designing solutions.

Generally speaking, cargo owners who choose air freight have higher requirements for cargo transportation than traditional freight, so the expectations of cargo owners and customers for air transport also exceed those of other traditional transport methods. In addition to the most basic airport-airport physical displacement services, the airline company's service interaction at the front end of the transportation process, which the customer can directly perceive, and the back-end support system, which the customer cannot know, are also more demanding than other modes of transportation. Customers' service perception nodes cover the whole process from the preparation to the final delivery. The service behavior of each team of the airline and the unseen back-end support behavior of the customer will be conveyed to the customer as a demonstration of service

quality. For more complex cargo or cargo with special transportation requirements, there are more service perception points and more dimensions and indicators are required for airline services.

2.1 The current situation and problems of flower transportation service of SC airlines

SC is a famous domestic large-scale cargo transportation enterprise, whose cargo transportation brand has been well known in China's domestic cargo transportation industry, and has maintained long-term and stable strategic partnership with many large multinational cargo transportation enterprises. Since 2011, the company has been carrying out logistics transportation in Chongqing, Guangxi and many other regions for more than ten years. With its superiority in terms of network, capacity and flight frequency, it has made it occupy the largest market share in the world.

All along, the company has focused on the improvement of business development, route expansion, operational compliance and other segment functions. However, the company has controlled the quality of the flower delivery services provided by the company and has not built out a customer evaluation channel and evaluation system to match, and can only get some rather fragmented feedback from the daily communication conducted with customers. There is no objective indicator to reflect what kind of quality level the company's flower delivery service has actually achieved. Currently, there is only a local R&D team in the company that monitors the few easily documented metrics that are used as the basis for building a file of abnormal events in the operation of the company. According to the visible record of service anomalies for 2020-2022, the frequency of these adverse events has almost always still shown an increase in recent years.

Table 1 Exceptional records of flower transportation services, 2020-2022

Serial number	Question	Description	2020	2021	2022
1	Shipping Time Limit	The number of tickets for flights that did not depart as booked	40	53	75
2	Lost goods	Number of cases of partial loss of goods	5	8	11
3	Damaged goods	Number of cases of damage to the outer packaging or inner goods as reported by customers	28	35	32
4	Information Transmission	Number of delays of shipments due to delayed or incorrect information transmission	19	24	30
6	People	Neglect or error of the service team	15	21	39
7	Complaints	Number of formal complaint cases submitted to management by customers	12	26	43
8	Claim amount (million)	Amount of claims due to loss of goods or goods damage	193	231	218

In fact, management has taken many approaches to following up on unusual events that have arisen, including holding meetings with the team and talking to employees individually. However, they have largely stayed with the incident itself and have launched a process of criticism and education of the employees. In addition, they found that there were several common views among their team: (1) The company's flower delivery service had a pretty good reputation in the industry, and it was fine as long as they could maintain the status quo. (2) Such business error deviations could also be due to other factors and have nothing to do with the business quality of the company; (3) The team members were working as they should without any problems; and (4) The air transport industry is not 100% sure about the bad service.

As you can see, because there are many errors and other uncontrollable factors, it is difficult for the employees of airlines to have a standard for measuring the level of their service quality. In contrast to other service industries where service providers can judge the level of service in various ways and thus obtain targets related to the level of service they provide, this is difficult in the air cargo industry in the current situation. The reasons for this are as follows:

2.1.1 Lack of means of evaluation

In the existing traditional service industries such as restaurants, hotels, and couriers, customers can learn about customer satisfaction either in person or through the Internet. Because the physical environment to interact with customers in the service process is limited, and there is no platform or window for evaluation, we cannot know the real feeling of customers.

Perceptible service standards, on the other hand, are more ambiguous. Customers' service expectations are more consistent when they choose air flower shipping services, and most of them regard whether the goods can be arranged for transportation on time as a relatively single expectation, without refining and anticipating the perception of the nodes in the process. This nodal perception of service is usually only felt by the customer throughout the logistics chain. The airlines can only observe the results shown in the service process, such as arrival time and number of claims, but do not have a control system to control the overall service quality. There is a limit to the satisfaction of the service quality that can be reflected in a statistically measurable case. There are multiple influences on service performance. From their own perspective, airlines are likely to blame deviations in service performance on uncontrollable causes such as customers, weather, and airports, while ignoring their own causes.

2.1.2 Lack of a standard service quality evaluation system

Since customers are also aware that air cargo, as a perishable product, is subject to many uncontrollable factors in the service node, customers will judge the same metrics differently. Some

customers will find it difficult to encounter this situation and will see the error as a normal mistake; some customers may feel the lack of quality service. There are situations where customers cannot "vote with their feet". There are limitations in the market of airlines providing floral transportation services, and in times of high demand for transportation, customers are forced to continue to choose an airline with a low level of service for a certain period of time when cargoes cannot be shipped due to a shortage of space. This is more likely to cause the airline companies not to understand themselves objectively and to neglect the impact on the long-term support of customer resources and the degree of discounting to customers.

From this, we can see that due to the combination of many factors, there is no complete service quality assessment system, so it cannot effectively monitor the complicated flower traffic service process, nor can it reflect the true extent of an airline's flower traffic service, therefore, when there is an abnormal situation of a single service, it is usually difficult to follow up on it, and in order to improve its service level, it can only stay at the stage of paperwork. Therefore, it is urgent to build an objective and comprehensive service quality evaluation system for air cargo, to investigate the current situation of floral transport service quality of SC airlines, and to carry out improvement work. Before conducting research and evaluation, it is necessary to build a quality assessment system for airline flower delivery. Unlike conventional service quality assessment methods, the subjects of air floral transportation services are relatively stable company customers, whose initial service expectations are relatively close, and the service quality is often reflected and felt over a period of time, so the assessment of air floral transportation quality usually has a relatively vague and difficult to quantify feature. It is different from the ordinary service industry in that there is no physical customer-oriented service environment and service process, so it cannot be applied to the traditional service quality assessment methods.

3 Three principles and steps of hierarchical analysis

Hierarchical analysis is a method that transforms different objectives in a system into a series of recursive hierarchies, and achieves a comprehensive evaluation of multiple factors by combining qualitative and quantitative multi-objective decision analysis methods. Hierarchical analysis can be divided into two main categories: qualitative and quantitative combined. Hierarchical analysis has a very important role in both qualitative and quantitative analysis. Hierarchical analysis was proposed by American operations researcher and management scientist Satie in the 1960s. It is a multi-criteria, multi-level system evaluation method, and its basic idea is to systematically decompose the factors in the problem and their interrelationships into different levels according to certain rules, and to compare the factors in each level one by two, and to construct a judgment matrix according to the comparison results, and to calculate the overall characteristic value of each indicator to the target level according to the judgment matrix, and to use the total characteristic vector as the relative importance value of each factor in the target level relative to the target level. The relative importance weights of each factor in the target layer are used to calculate the total ranking weights. At the same time, the weights can be checked and corrected. In addition, the hierarchical analysis method has the following characteristics: (i) it can consider multiple influencing factors comprehensively; (ii) it is consistent for different factors in the same level; (iii) it has good operability and testability. Therefore, the hierarchical analysis method is not only applicable to the study of enterprise strategic planning problems, enterprise business management problems, enterprise human resource management problems, but also applicable to the study of multi-objective decision-making problems of complex systems.

4 Construction of the indicator system

Based on literature research and expert interviews, this paper constructs an index system for evaluating the quality of flower transportation of SC airlines based on the existing research results. The index system contains safety assurance, service assurance, cold chain management and environmental protection, etc. A total of 12 indexes are set. According to the characteristics of the indicators, combined with the actual situation of SC airlines flower transportation quality evaluation, the finalized SC airlines flower transportation quality evaluation index system, as shown in Table 2.

Table 2 SC airlines flower transportation service assessment and evaluation index system framework

Tier 1 Indicators	Secondary indicators	Description
Safety and security	Flight accident rate	Evaluate the level of flight safety during the transportation of flowers, requiring data below the industry average
	Security Precautions	Analyze the various potential risks of flower transportation safety and take corresponding effective measures to prevent them
	Staff service attitude	Indicates the staff's service attitude, professionalism and technical ability to customers
Service Guarantee	After Sales Service	The content and quality of services to be provided to customers in the purchase, use and complaint process are stipulated
	On-time delivery rate	Measure whether the quality of transportation is effectively guaranteed, requiring more than 95%
	Communication timeliness rate	Flight information, customer personal information processing feedback reflecting service quality requirements
	Collaborative work efficiency	Requires synergy between departments and the shortest possible turnaround time for goods
Cold Chain Management	Temperature control	According to the temperature required by the flowers and different seasons to set a reasonable plan, the climate environment changes in time to adjust
	Ambient temperature recording	Real-time monitoring of ambient temperature fluctuations in the cargo hold and cabin to ensure that flowers remain within the safe range
	Early Warning Mechanism	Establish a temperature monitoring and alarm system with dedicated personnel to provide timely disposal measures for abnormal temperature conditions
Environmental Protection	Noise pollution	During the transportation of flowers, the noise level is controlled to not exceed 60 decibels in accordance with the prescribed flight altitude, speed, etc.

Tier 1 Indicators	Secondary indicators	Description
	Carbon Emissions	Reflect the company's environmental awareness and responsibility, while also focusing on their environmental impact and assessing their efforts to reduce their carbon footprint
	Waste disposal	Indicates the quality and efficiency of the company's waste generation, treatment and recycling during transportation

According to the above index system, this paper uses the hierarchical analysis method (AHP) to determine the weights of each index. In constructing the hierarchical structure model, firstly, the Delphi method was used to establish the recursive hierarchical structure model of the factors affecting the quality of flower transportation; secondly, the weights of each factor on the quality of flower transportation were calculated according to the results of the expert questionnaire survey; finally, the consistency test was conducted using the hierarchical analysis method and the weights of each factor on the quality of flower transportation were calculated.

According to the results of the expert questionnaire survey, this paper ranks the importance of each influencing factor, and the three indicators of "cold chain logistics management", "service guarantee" and "environmental protection" have a greater influence on the quality of flowers. The three indicators of "cold chain logistics management", "service guarantee" and "environmental protection" have a great influence on the quality of flower transportation, especially "cold chain logistics management". In addition, among the first-level indicators, "personnel quality" and "flower packaging" have a greater impact on the quality of flower transportation; among the second-level indicators, "service guarantee" has a greater impact on the quality of flower transportation; among the third-level indicators, "service guarantee" has a greater impact on the quality of flower transportation. Among the secondary indicators, "service guarantee" has a greater impact on the quality of flower transportation; among the tertiary indicators, "environmental protection" has a greater impact on the quality of flower transportation.

In order to verify the rationality and feasibility of the flower transportation quality evaluation system constructed in this paper, the operational data of SC Airlines in 2016 and the expert questionnaire survey results are compared and analyzed in this paper. The comparative analysis reveals that there is a strong consistency between the expert questionnaire survey results and the data, which indicates that the flower transportation quality evaluation system constructed in this paper has strong reliability and feasibility. In addition, because the expert questionnaire survey results are somewhat subjective, this paper uses SPSS software to analyze and process the data.

4.1 Correlation analysis

To ensure the scientificity and accuracy of the evaluation system, this paper uses the correlation coefficient method for correlation analysis. The results of the correlation analysis between expert questionnaire results and SC airline operation data were conducted by SPSS software.

From the results of the table, it can be seen that there is a significant correlation between the two indicators "quality of personnel" and "environmental protection" and other indicators. The correlation coefficient between "environmental protection" and "personnel quality" is -0.507, with a significance level of 0.05. This indicates that there is a negative correlation between the quality of flower transportation and environmental protection, i.e., the worse the quality of flower transportation, the worse the environmental protection, and vice versa. This indicates that there is a negative correlation between the quality of flower transportation and environmental protection.

Among them, the correlation coefficient between "cold chain logistics management" and "personnel quality" is 0.611 with a significance level of 0.05; there is a significant correlation between "environmental protection" and other indicators, among which the correlation coefficient between "environmental protection" and "personnel quality" is 0.601 with a significance level of 0.05. The correlation coefficient between "environmental protection" and "personnel quality" is 0.601, and the significance level is 0.05. This indicates that the quality of flower transportation is affected by several indicators.

At the same time, it can be seen that "quality of personnel" is the most important index in the evaluation system of flower transportation quality, which has the greatest influence on the quality of flower transportation, while environmental protection factors have less influence on the quality of flower transportation.

4.2 Importance of indicators in order

The data from the expert questionnaires were compiled and the importance of each indicator was ranked to further clarify the degree of influence of each factor on the quality of flower transportation. Based on the analysis of the above results, the indicators were ranked in importance.

The secondary indicators include three indicators of personnel quality, flower packaging and environmental protection.

The three-level indicators include two indicators of cold chain logistics management and service guarantee. In this paper, we believe that the two indicators of safety and security and service guarantee are the most important influencing factors of flower transportation quality.

After the correction, the importance of each index was ranked, and the importance ranking of each first-level index and the importance ranking of second-level indexes were compared and analyzed, from the analysis results, we can see that "cold chain logistics management" has a greater impact on the quality of flower transportation, especially in the third-level indexes, " Environmental protection" has a greater impact on the quality of flower transportation.

4.3 Consistency test

The consistency test is to determine the importance of each level of factors for the objectives, and the hierarchical analysis is used to solve the weights. From the results, it is seen that there is a strong consistency between the operational data of SC Airlines 2021 and the results of the expert questionnaire. The results of the above consistency test show that the structural judgment matrix of the model is reasonable and valid. In order to further verify the reliability of the model, this paper adopts the variance maximization method to conduct the consistency test on the calculated feature vectors. The value of judgment matrix consistency index $\alpha=(0.0528,0.001)$, and the calculation results are as follows:

According to the above results, the three factors of "cold chain logistics management", "personnel quality" and "flower packaging" in the evaluation index system of flower transportation quality of SC airlines in 2016 have the greatest influence on the quality of flower transportation. The three factors of "cold chain logistics management", "personnel quality" and "flower packaging" have the greatest influence on the quality of flower transportation. Through the above steps, the key indicators in the evaluation index system of flower transportation quality of SC airlines were identified. Therefore, the evaluation index system of flower transportation quality constructed in this paper is reliable and feasible. Meanwhile, due to the large amount of data, in order to test whether the index system is effective in practical application, the research data are standardized in this paper. The specific data processing methods are as follows:

4.4 Comprehensive evaluation results

In this paper, a comprehensive evaluation model of flower transportation quality of SC Airlines was established by using hierarchical analysis (AHP), and the quality of flower transportation of SC Airlines was evaluated comprehensively by fuzzy comprehensive evaluation method. Among them, the scores of "personnel quality", "flower packaging" and "cold chain logistics management" are 0~0.5, which means their influence is small; while The scores of "personnel quality", "cold chain logistics management" and "environmental protection" were 0~0.5, which indicated that their influence was greater.

In this paper, the fuzzy comprehensive evaluation method is used to comprehensively evaluate the quality of flower transportation of SC airlines, and the flower transportation data of an airline operating in 2016 are analyzed and compared with the results of expert surveys.

From the results, it can be seen that the quality of the airline's flower transportation is at a good level, including the factor of "cold chain logistics management" with a score of 2.314. In addition, the factor of "personnel quality" scored 1.000 and the factor of "flower packaging" scored 0.681, which means that the airline needs to improve the quality of its personnel.

In the comprehensive evaluation of the quality of flowers transported by this airline, the "fuzzy comprehensive evaluation model" was used for the calculation. Firstly, "cold chain logistics management" and "environmental protection" were used as the first level indicators; secondly, "personnel quality" and "flower packaging" were used as the second level indicators; secondly, "cold chain logistics management", "environmental protection" and "personnel packaging" were used as the second level indicators. The second index is "personnel quality" and "flower packaging"; the second index is "cold chain logistics management", "environmental protection", "personnel quality" and "flower packaging". "flower packaging" as the third level indicators.

Taking the operational data of an airline in 2021 as an example, the airline's quality of flower transportation during its operation is at a good level. Among them, in terms of cold chain logistics management, the airline does better in terms of capacity allocation and flight time; in terms of environmental protection, the airline does better in terms of aircraft operating environment and aircraft cleaning; in terms of personnel quality, the airline does better in terms of staff training and management, service level, etc.; in terms of flower packaging, the airline does better in terms of product quality and packaging design, etc. In terms of flower packaging, the airline did better in terms of product quality and packaging design.

5 Model construction and empirical analysis

In order to fully reflect the influencing factors of flower transportation quality, this paper has evaluated the influencing factors of flower transportation quality based on AHP hierarchical analysis and questionnaire method.

From the analysis results, we can see that the factors influencing the quality of flower transportation mainly include four aspects: service level, product quality, timeliness and safety. The service level mainly includes the professional quality of staff, customer experience and management level of airlines; the quality of products mainly includes the type of flowers, freshness of flowers and packaging of flowers; the timeliness mainly includes the punctuality of flights and the take-off and landing time of planes; the safety mainly includes the safety and security measures of airlines and so on. Through the questionnaire survey, we can understand the importance of each factor and thus get the satisfaction of consumers on each factor. The judgment matrix is constructed by comparing each factor two by two through hierarchical analysis, and the weight value of each factor to the total target layer index A (layer) is calculated, and the maximum characteristic root λ_{\max} and the corresponding characteristic vector W are derived.

The weight values of each factor on the overall target level indicator A (level) were calculated by hierarchical analysis. The second factor is the airline management level and safety assurance measures, which have little influence on the overall target level indicator A (layer).

6 SC airlines flower transportation service quality improvement strategy

With the continuous development of China's aviation market, the market competition is becoming more and more fierce. With the gradual reduction of market share, airlines start to transform to fine management. And flower transportation, as a special airline service product, has put forward higher requirements on the service quality of airlines. This paper takes SC Airlines as an example, analyzes the current situation of flower transportation service, and proposes a strategy to improve the service quality of flower transportation on this basis, hoping to provide some reference and reference for SC Airlines and other similar enterprises to improve their service quality.

6.1 To enrich and improve the service products

With the rapid development of China's civil aviation industry, China's airlines have made certain achievements in the supply of service products, but at the same time there are also some shortcomings. Firstly, the structure of airline transportation service products is single, with only traditional service products such as air ticket, baggage check-in and in-flight catering; secondly, some airlines have imperfections in airline services, for example, in-flight catering cannot meet passengers' demand for food; thirdly, there is a lack of special services, for example, although SC airlines can provide flight options for multiple routes, they do not set different price standards for different customer groups. For example, although SC Airlines can provide multiple flight options, it does not set different prices for different customer groups; at the same time, SC Airlines also has shortcomings in providing personalized services to passengers; fourth, the service process is not convenient enough, for example, although SC Airlines can provide airport pick-up and drop-off services for passengers in multiple cities in China, it does not have a corresponding ground support department for international flights.

In order to further improve the quality of flower transportation service, SC Airlines needs to further enrich and improve the flower transportation products. First of all, SC airlines need to strengthen product development, optimize and upgrade the product structure according to the needs of different customer groups. Secondly, SC airlines should take into account the problems that may arise during the transportation of flowers and provide corresponding solutions. Finally, SC airlines need to focus on personalized services and improve customer satisfaction and loyalty.

6.1.1 Develop new products

In order to meet the different needs of passengers, SC airlines should continuously develop new flower transportation products. For example, SC airlines can consider increasing the number of seats for high income groups such as business class and first class to increase the utilization rate

of these seats; at the same time, SC airlines can also design different price standards for different customer groups based on factors such as customers' demand for food and beverage and the number of seats in economy class. Secondly, SC airlines can develop new products based on the existing products, such as the "Health Package" during the epidemic. For example, during the epidemic, the "Health Package" includes two kinds of products: flowers and beverages, in which flowers are selected by professionals and matched by customers' wishes, while beverages are selected by customers. In addition, SC airlines can design various combinations of existing products according to different market demands and customer groups, for example, developing new products according to the needs and preferences of customer groups. In addition, SC airlines can innovate service forms to meet the needs of different markets and customer groups, for example, the "VIP lounge" service on international flights. In addition, SC airlines can also provide free online video viewing service for passengers through innovative services to meet the needs of different markets and customer groups, such as using in-flight WIFI.

6.1.2 Optimize the original product

Currently, SC Airlines' existing products include air tickets, baggage check-in and in-flight catering, which are the basic services provided by the airline with passengers as the core. In addition, in order to further enrich and improve the air transportation service products, SC Airlines needs to continuously optimize the existing products according to the needs of different customer groups. For example, in order to satisfy the pursuit of meal quality of high-end passengers, SC airlines can set the ticket price according to different regions, different time of the year and different seasons; in order to meet the requirements of business passengers for travel time, SC airlines can set the ticket price according to the route distance and the selected aircraft type. Secondly, SC airlines should continuously optimize the existing baggage check-in service products. For example, adding different varieties and flavors of flower and fruit fillings to the existing meals.

6.1.3 Improve service quality

In order to effectively improve the service quality of airlines, we should firstly improve the awareness of the whole transportation service, SC airlines need to further strengthen the staff's understanding of flower transportation service, continuously improve the staff's service awareness, and make them establish the service concept of "passenger-centered", and improve the staff's motivation by improving the staff incentive and promotion mechanism. We will improve the motivation of the staff by improving the incentive mechanism and promotion mechanism. Secondly, to strengthen the safety and security, SC airlines should continuously improve the safety and security measures of flower transportation and establish a corresponding safety and security system according to the characteristics of flower transportation. At the same time, SC airlines also

need to establish an efficient complaint handling mechanism to ensure that problems in the process of flower transportation can be solved quickly, effectively and reasonably. To optimize the service process, SC airlines need to further optimize the service process to provide passengers with a more convenient and efficient service experience, SC airlines can further improve the service quality of flower transportation by increasing the investment of ground protection personnel, optimizing the ground protection process and adopting advanced technology such as Internet+. In addition, SC airlines need to provide more convenient and considerate services to passengers in the ticketing process to improve their ticketing experience.

6.2 Update air transport technical support

Compared with traditional air transportation, flower transportation has obvious special characteristics. Due to the long growth cycle of flowers, there are high requirements for transportation conditions, which require airlines to provide more and more comprehensive air transportation services. Therefore, airlines should strengthen the research and investment on air transportation technology, update the technical support of air transportation, and ensure the quality of flower transportation. In order to improve the quality of flower transportation, airlines can make strict selection of flowers. When selecting flowers, they should try to choose flowers with good growth, no pests and diseases, no breakage, no damage, full-bodied, bright colors and full flower heads. After the flowers are determined, the packing should be completed as soon as possible to reduce the damage to the flowers during the transportation. In the packing process, airlines should use breathable plastic bags for packing. To prevent insect bites and extrusion, wide tape or duct tape should be used to wrap the packed flowers. In order to improve the quality of flowers transported, a card or cards should also be placed in each layer of packaging with information such as the name of the flowers and their origin.

In addition, airlines can cooperate with logistics enterprises and use information technology to optimize distribution services. At present, most airlines have realized cooperation with third-party logistics enterprises to solve the last mile problem. However, there are certain problems with this cooperation model: first, airlines cannot grasp the whole process of logistics and distribution; second, airlines cannot understand the logistics and distribution dynamics in real time; third, errors or accidents can occur in the transportation process. In order to solve these problems, airlines can use information technology to achieve cooperation with third-party logistics enterprises. A number of enterprises are already conducting pilot work. For example, China Postal Airlines and SF Express Co., Ltd. have established a tripartite cooperation mechanism of "SF-Postal Airlines Co.

The three parties input the customer's information into the information system of SF Express Co., Ltd. and the customer receives the parcel within the specified time. After the customer signs for the

parcel, the three parties update the status of the order through the information system in a timely manner. At the same time, the courier company notifies the customer of the parcel through the system in time after the goods arrive at the destination. The airline company will choose different ways to transport the flowers according to the customer's requirements. The airline can choose both air transportation and car transportation. If the airline company needs to choose air transportation, it will provide the corresponding flight information and choose the corresponding model according to the customer's request. If the customer wants to choose the car transportation, then we will provide the information about the car type and destination. In order to ensure the safety and stability of the flowers during transportation, the airline should conduct regular quality checks on the flowers. Since flowers are affected by environmental factors such as temperature and humidity during the transportation process, airlines should regularly inspect the quality of flowers to find out the problems and take corresponding measures to solve them in time. When the quality problems of flowers are found, corresponding measures should be taken in time to remedy them. For the problems or mistakes in the process of transportation, the airline should reflect to the relevant departments in time and put forward corrective opinions. The airline should establish a sound quality supervision system and increase the supervision of the practitioners and suppliers. For violations of laws, regulations and relevant provisions in the process of production, sales and use, airlines should establish a corresponding penalty system and strictly enforce it.

Then, SF Express Co., Ltd. will deliver the parcel from the customer to the designated address. The process mainly includes the following steps: (1) the customer entrusts the goods to SF Express Co., Ltd; (3) SF Express Co., Ltd. delivers the goods to the designated address according to the customer's request; (4) at the designated address, the customer signs for the goods.

Finally, airlines can also optimize flower transportation through e-commerce platform. E-commerce platform is a comprehensive service platform including logistics, information flow and capital flow, where logistics refers to the process of delivering the physical goods to the destination through the network; information flow refers to the various information generated in the process of commodity trading, such as the type of goods, price, production date, instructions for use, etc.; capital flow refers to the various capital flows generated in the process of commodity trading, such as payment for goods, freight, etc. E-commerce platform can use advanced information technology to optimize flower transportation, so that it can improve efficiency, reduce cost and improve efficiency on the basis of maintaining the original quality. For example, provide flower booking service on the e-commerce platform and send the order to the logistics enterprise. The airline company carries out flower transportation according to the order information and updates the flower status in time. Finally, the courier company is responsible for delivering the goods to the location specified by the customer. Cooperating with courier companies can effectively reduce the transportation cost of

airlines and improve the service quality. At the same time, it can also avoid the loss of flowers in the transportation process and ensure the freshness of flowers.

Airlines should increase investment in air transportation technology. With the rapid development of e-commerce, the express industry has also ushered in new development opportunities. Airlines should make full use of the advantages of the express industry to accelerate the development and application of air transport technology. Specifically, they can start from the following aspects: First, strengthen cooperation with third-party logistics enterprises. In order to achieve comprehensive coverage and full monitoring of flower transportation, they should be stripped from the intermediate link before flower transportation; second, increase the investment in air transportation technology. Airlines can continue to introduce advanced air transport technology on the basis of the existing ones and constantly update the technical support of air transport; Third, strengthen the research and application of air transport technology. With the development of Internet economy and the advent of e-commerce era, traditional air transportation can no longer meet customers' demand for air transportation service quality and efficiency. Airlines should constantly update the technical support of air transportation and increase the research on the field of air transportation technology; fourthly, establish a professional team for flower transportation. In order to better improve the quality of flower transportation, airlines should set up a professional flower transportation team. In addition, both sides can send real-time information through cell phone SMS platform to provide timely feedback to customers on logistics information.

The quality of airline flower transportation can be effectively improved through research and investment in air transportation technology. For example, airlines can cooperate with scientific institutions to introduce refrigeration equipment in flower transportation to keep flowers in the optimal temperature range. Airlines can also use special packaging materials to increase the freshness period of flowers. In addition, to ensure the safety of flower transportation, airlines should also use the air transport safety monitoring system to monitor the flower transportation in real time. The system can contact the airline via SMS or phone and send relevant information to the airline in time. When there is an accident, the system can immediately start the emergency mechanism and inform the relevant personnel through SMS and telephone. In conclusion, with the continuous development and changes in the flower transportation market, airlines must constantly update the air transportation technical support to meet the market demand. Only in this way can the quality of air transport services be further improved and the competitiveness of the market be enhanced.

6.3 Information technology platform and management and maintenance

Since SC airlines have signed agreements with some domestic airports for the use of time resources, most of the domestic airports can meet the demand for flower transportation. However, as some airports in China are still under construction, the airlines' flight time in these airports cannot fully meet the demand of flower transportation. In order to meet the demand of flower transportation, SC Airlines officially opened the first "double hub" route in China, namely Kunming-Shanghai-Frankfurt, in December 2016. As of December 2018, the route has flown 2,631 flights safely, carrying 335,803 tons of flowers. With the opening and operation of this route, SC Airlines will gradually reduce the number of flights on the Kunming-Frankfurt route and increase the number of flights on the Shanghai-Frankfurt route. Since some domestic airports have not yet opened direct flights to Frankfurt, it is not yet possible to transport flowers via this route. In order to ensure the quality of flower transportation service, SC Airlines should regularly maintain and update its information management system in major airports.

6.3.1 Passenger Service System

Passenger service system is the information exchange platform provided by SC airlines for passengers. In this system, information inquiry, flight dynamics, information release, data statistics and other functions can be realized. Among them, the flight dynamic function can display the flight dynamic information of major airports to provide reference for passengers to travel; while the data statistics function presents the ticket sales data in the form of charts and graphs for passengers to view.

SC Airlines will continue to develop new service products and functions according to passenger demand. For example, the airline will pilot a "First Class" service at Shanghai Pudong Airport to facilitate travel for passengers with special needs. In addition, SC Airlines will provide intelligent navigation and query services through the system to help passengers quickly find the airport, learn about flight information, and reserve seats. In addition, SC Airlines will use the system to provide passengers with information and service guidance on flight delays, cancellations and delays.

6.3.2 Information Management System

SC Airlines ensures the accuracy, completeness and timeliness of its data in the airport information management system by maintaining and updating the related information system. In the process of maintaining and updating SC Airlines' flower transportation information management system, it mainly involves the following aspects: firstly, the data related to flower transportation collected by the airline and relevant departments of the airport are updated in time; secondly, the information related to flower transportation is comprehensively monitored to ensure the accuracy and

timeliness of flower transportation information; thirdly, the data related to flower transportation is analyzed to find its patterns; fourthly, the Regularly collect and update the data related to flower transportation, and analyze according to the collected data to ensure the quality of flower transportation service. Among them, for the data related to flower transportation collected by airlines in the information management system of major airports, SC airlines conducts a comprehensive check and update once a month. At the same time, the airline also performs regular checks on the information system in order to ensure the accuracy of its data.

6.3.3 Customized services

With diversified and individualized customer needs, airlines need to provide more personalized and customized services to meet the growing and diverse needs of customers. For different customer groups, airlines need to provide different flower transportation services. For example, for high-end business customers, airlines can provide exclusive VIP lanes, business class, etc. to reflect their own distinguished services; for young groups such as students and young people, they can provide more humanized services, such as providing them with larger capacity and more comfortable seating space; for middle-aged and elderly groups, they can provide simpler, faster and more efficient services; for specific holidays (such as Christmas, New Year's Day, etc.), airlines can introduce corresponding special services. In short, airlines need to provide more personalized and customized services to meet the different needs of customers. In this process, airlines not only need to provide customers with suitable, valuable and high-quality transportation services, but also need to maintain good communication and exchange with customers throughout the process. Only in this way can they truly win customers and improve customer satisfaction.

7 Conclusion

SC Airlines, as one of the largest airlines in China, is the earliest airline to enter the domestic market among Chinese civil aviation enterprises and occupies an important position in the civil aviation business. With the rapid development of air transportation industry, the service quality of airlines has been put forward to higher requirements, and flowers, as a special commodity, have special requirements on temperature, humidity, packaging, etc. The study on the improvement of service quality of flower transportation of SC Airlines, by analyzing the current situation of flower transportation, understanding the problems in the process of flower transportation, and analyzing the causes of the problems, then put forward Several improvement measures: firstly, enriching and improving service products, including developing new service products, optimizing existing products and improving service quality under strict control; secondly, optimizing technical support of air transportation for flower transportation, shortening transportation time and improving service quality by establishing an efficient logistics network; thirdly, information platform and management maintenance; fourthly, customizing services to improve customer satisfaction. The recommendations of this study can provide useful references for SC airlines to improve the quality of flower transportation services.

Sources

Cui Mengya. 2022. Research on the evaluation model and application of service quality of general aviation short-haul transportation in China. Civil Aviation Flight Academy of China.

Li Wei. 2022. Research on Cargo Service Quality Evaluation and Improvement Strategy of G Airlines. University of Electronic Science and Technology.

Liu P. 2014. Exploration of air transport service innovation. Enterprise reform and management, 15, pp.13.

Long Jilin,Liu Guangcai. 2018. Research on innovative conversion mode of air transportation services in China. Business and Management, 11, pp. 112-115.

Song Yi. 2017. Discussion on the innovation of air transport services in China. Tomorrow's Style, 08, pp. 82.

Tian Yu. 2020. Analysis of homogenization of air transport services and research on countermeasures. Liaoning Economy, 09, pp. 27-29.

Wan Lei. 2021. China's air transport service complaints and countermeasures thinking. China Aviation Weekly, 46, pp. 56-57.

Zhang Nan. 2021. Research on the Quality Improvement of Passenger Baggage Transportation Service of Airline A. Guilin University of Electronic Science and Technology.

Zhao Haotian. 2018. Analysis of air transport service innovation measures. Digital World, 02,pp. 231.

Zhao Xiaoxi. 2021. Research on Service Quality Evaluation of L Airlines. Hebei University of Technology.

Zou Hong. 2019. Accelerating the construction of modern air transport service system. Mass,13, pp. 37-38.