SF Airlines Cargo Service Quality Evaluation and Research

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Abstract

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The civil aviation industry is developing rapidly, and air cargo is also becoming more and more important in the logistics system. Since the COVID-19 outbreak began in 2020, all kinds of logistics channels have been blocked, and air cargo as an important logistics method is once again visible. In such a context improving the quality of cargo services is a crucial step to enhance air cargo.

Firstly, the purpose of this paper is to find out which dimensions should be investigated by SF Airlines, which dimensions affect the quality of SF Airlines cargo services and how the company will improve the service quality in the future. Secondly, based on the customer's perspective, this paper reads the relevant literature and uses the SERVQUAL model to build a service quality evaluation index system that meets the air cargo process and characteristics, and identifies 7 evaluation dimensions and 22 evaluation indexes. Finally, the questionnaire was designed through the evaluation index system, distributed, collected, and tested by reliability and validity analysis.

The results indicate that there are gaps in customer expectations and customer perceptions in each dimension of SF Airlines, and suggestions are made based on the gaps in each dimension. A small gap indicates that the customer experience in these dimensions is not bad and can be improved on the basis of the previous dimensions; a large gap indicates that customers want to have a better customer experience in these dimensions and can be targeted for improvement. These suggestions are used to improve the quality of SF Airlines' cargo services.

Key words
Cargo, SERVQUAL model, Service quality

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1 Introduction

This paragraph includes the research background, research purpose, research significance, and research idea framework of the thesis. It shows that there is a great development in air cargo and there should be an improvement in the quality of air cargo services.

1.1 Background of the research

Since the 21st century, along with the rapid development of civil aviation and the process of trade globalization, air cargo is becoming more and more important in the global logistics system. Compared with other traditional transportation methods such as ocean freight, rail freight, and road freight, air freight is fast, stable, safe and reliable, but also has the highest transportation costs, so it accounts for a small percentage of the traditional freight industry. With the rapid progress of technology, globalization of supply chain, digital transformation, accelerated product replacement, global consumption upgrade, the rise of e-commerce and other factors, the cargo requirements for efficient and reliable transportation services continue to rise, air cargo began to usher in a huge opportunity for development. (Li Wei 2022, 1-5.)

Air cargo also faces many challenges, especially in the level of service quality, in China's air passenger service quality level has been raised to the international advanced level, China's air cargo service quality can be said that there are still some problems. On the one hand, the long-standing "emphasis on business over service" concept of the impact of the quality of cargo services. On the other hand, the customer's awareness of the quality of air cargo services and requirements are also increasing. The reason for this is that the price paid by the customer should match the quality of service, not just the business purpose of getting the goods to their destination.

In the competitive air transport environment, airlines are not only trying to establish more convenient routes and increase flight frequency, but also introducing more promotional incentives. However, the effect of these marketing strategies has not had a strong impact on customers, as most airlines have applied the same marketing strategies have a certain homogeneity and do not reflect differentiation. Therefore, airlines now need to focus more on how to improve service quality. Understanding, maintaining and improving the quality of service is a major concern for airlines today. Airlines should seize the opportunity of air cargo in order to serve more effectively the logistics needs of manufacturing, retail, e-commerce and other industries in the modern global society and gain more economic benefits to achieve a win-win situation.

1.2 Research purpose

The main research question of this paper is which dimensions of cargo service quality should be investigated by SF airlines? By constructing a service quality evaluation system, which dimensions influence the level of service quality perceived by customers? In the future, what should be done to improve SF airline cargo service quality evaluation?

This paper uses the SERVQUAL evaluation model, which is a questionnaire designed by the model, to conduct a customer survey on SF Airlines' cargo service quality, collect the survey data and analyze it, make an evaluation for the company's cargo logistics service quality, and draw conclusions to provide a reference for enterprises to control and improve the logistics service quality. It is very important for SF airlines to avoid the challenges and opportunities in this environment and to maximize their advantages in order to adapt to the future market.

1.3 Research significance

This thesis establishes SF airlines' cargo service quality evaluation system and conducts a customer questionnaire survey on cargo service quality, outlining the actual service situation of SF airlines' cargo and customer service perception points in the process from more complete dimensions and indicators, providing a reference for other companies' service quality related practices in the industry, and also playing a certain role in introducing a certain theoretical significance for air cargo related research.

In the sense of practical application, by establishing scientific evaluation indexes and adopting a suitable evaluation process, the shortcomings of airlines in actual services can be more accurately identified. According to these shortcomings, airlines can put forward targeted suggestions for improvement, so that air cargo customers can improve the service demand of airlines and promote the development of the industry. From the simple freight rate orientation to the value orientation matching freight rate and service.

1.4 Research structure

This paper is divided into six chapters, of which chapters 4 and 5 are the core.

Chapter 1 is the introduction, which introduces the background of the study, the purpose and significance of the study, and describes the framework of the research idea of the whole paper.

Chapter 2 is the theoretical framework, which summarizes the existing research results and introduces the research method through the related literature such as cargo service quality evaluation research and air cargo service quality evaluation research.

Chapter 3 is the introduction of SF Airlines and cargo process, introducing the basic situation of SF Airlines and the overall air cargo process.

Chapter 4 is the method, which focuses on identifying evaluation dimensions and indicators through the SERQUAL model, creating questionnaires through these dimensions and indicators, and conducting reliability and validity analysis using the collected questionnaire feedback data.

Chapter 5 is the result, which analyzes the causes of service quality gaps based on the feedback data of the questionnaire, analyzes the causes of gaps in depth and gives suggestions for improvement based on these gaps.

Chapter 6 is the conclusion, which summarizes the findings of the entire thesis, lists the areas that still need improvement, and explains what has been learned through this paper.

1.5 Research idea framework

Firstly, starting from the development of air cargo in China, the process and current situation of cargo service quality of SF airlines are described. Secondly, the cargo service quality of SF airlines is studied and the evaluation model of cargo service quality of SF airlines is constructed by combining with the actual situation.Then, the SERVQUAL model is used to determine the dimensions and a questionnaire is set up for investigation.Finally, according to the investigation results as well as the data, problems are identified and solved to improve the service quality. (See Figure 1)

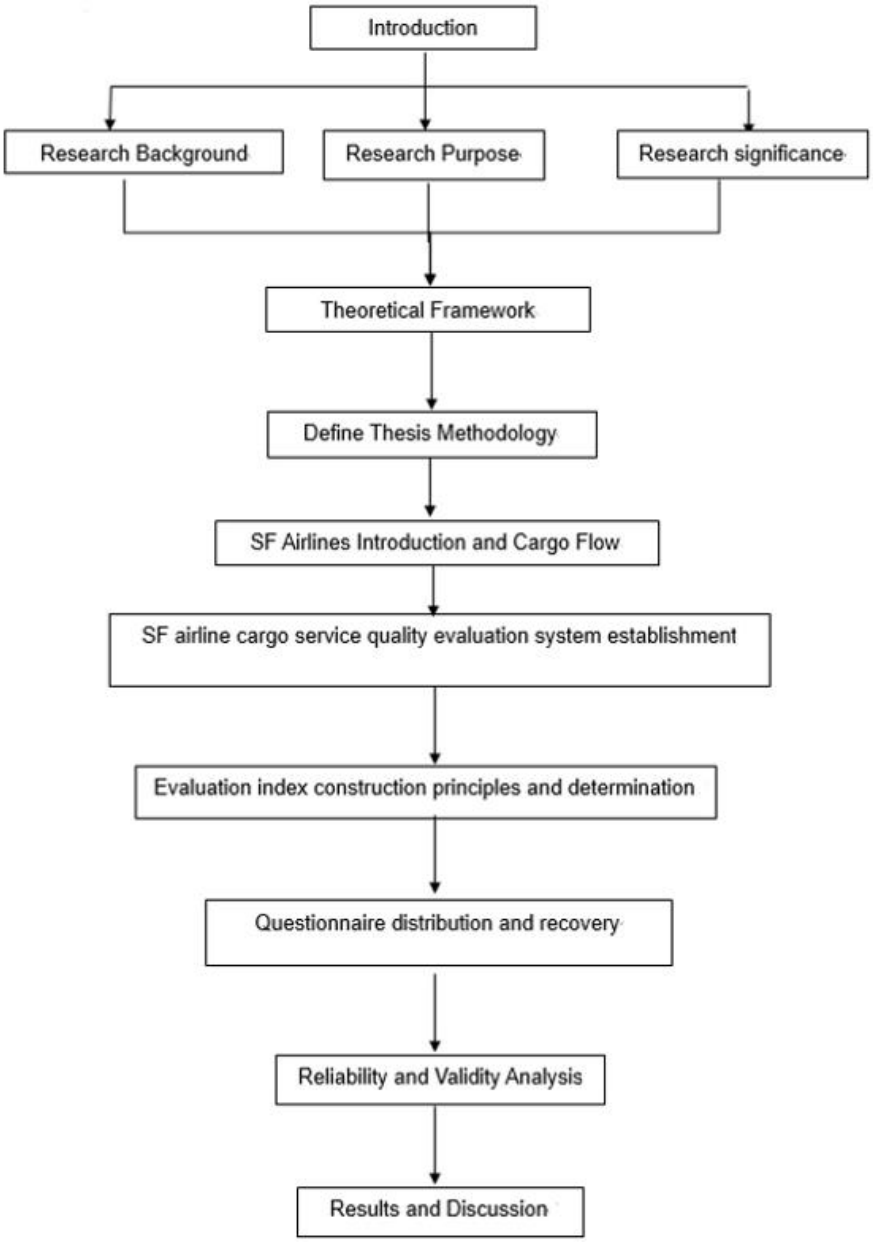

Figure1. Ideas Framework Figure

2 Theoretical framework

This section includes the current status of domestic and international research on cargo service quality evaluation. In the context of the continuous development of air cargo and the increasing importance of service quality by customers, it analyzes how to determine the research method and the introduction of the thesis research methodology.

2.1 Current status of domestic and international research

1. Cargo service quality evaluation study

With the continuous research on service quality evaluation system, many scholars began to pay attention to the problems related to the evaluation of railroad freight service quality in China, and tried to construct a set of theoretical system on the evaluation of cargo transportation service quality in railroad industry by introducing some foreign research methods. (Xinjun Zhou 2008, 19-22.)

Railroad freight service quality is related to the survival and development of railroad freight transport enterprises in the transport market and reflects the core competitiveness of railroad freight transport enterprises. Regarding the research on freight service quality evaluation, some scholars, in order to further improve the service quality of railroad cargo transportation, construct the railroad freight service quality evaluation index system based on the analysis of railroad freight business processes and service quality standards, choose SERVQUAL evaluation method to construct the railroad freight service quality evaluation model, analyze the actual perceived value and expected value of customers' railroad freight service quality according to the survey results, and derive Railroad freight service quality rating, to provide solutions and references for the overall improvement of railroad freight service quality. (Guolin Gu, Bingzhi Wu & Wangbei, 2021, 41-46.)

The study of railroad cargo service quality evaluation can effectively improve the competitiveness of railroad cargo in the transportation market. In recent years, with the adjustment of industrial structure, the competition between various modes of transportation has intensified. In order to improve the level of railroad freight service, enhance the competitiveness of railroad transport market, promote the railroad sound freight marketing system, meet customer needs, and comprehensively improve the quality of railroad freight service has become a problem that railroad enterprises need to face. And the construction of railroad freight service quality evaluation index system, scientific and accurate evaluation of railroad freight service quality is the key to improve the quality of railroad transportation. Based on the SERVQUAL evaluation method, the railroad freight service quality evaluation index system is constructed by combining the actual situation of

railroad freight service, adding transparency, economy and safety to the original 5 dimensions of the SERVQUAL evaluation system, and finally determining 32 indexes in 8 dimensions. Analyze the actual perceived value and expectation of customers on railroad freight service quality, and derive the service quality score of railroad freight center to provide theoretical basis for railroad enterprises to improve service quality. (Wenlin Zhang, Xiaoping Guang & Jingrui Zhang 2019, 41-47.)

With the continuous development of logistics, customer demand, logistics structure and service quality have changed greatly, and only by continuously improving service quality and enhancing customer experience satisfaction can the market competitiveness of railroad enterprises be enhanced. SERVUQAL model is used to combine the main points of railroad freight service quality, establish the railroad freight service quality evaluation index system, find out the advantages of freight service quality and the direction of improvement needed, so as to provide a basis for the accurate development of service quality optimization plan. (Li Yong 2020, 33-38.)

2. Air cargo service quality evaluation study

Four major airlines in the Chinese market were surveyed to discuss the relationship between service quality and customer satisfaction, as well as the airlines' retention conditions for existing passengers. Consistent with previous studies, service quality variables influence the level of customer satisfaction. Different marketing strategies are suggested for different market segments to increase customer loyalty. (Hongwei Jiang & Yahua Zhang 2016.)

The rapid development of the global economy, the development of air cargo has new opportunities, and the service quality of air cargo also has new challenges. Along with the industrial transformation and upgrading, the new business model and new mode represented by cross-border e-commerce continues to penetrate, and the residents' food consumption demand is accelerated and upgraded, etc., the new requirements for air cargo services are more efficient, higher quality and faster. To this end, through an in-depth analysis of the macro development and service operation trends facing China's air cargo, relevant countermeasures are proposed to provide a theoretical basis for China to build an independent and controllable international logistics supply chain system and achieve a higher quality and high level of air cargo development. (Linlin Li, Zhihong Liu & Jinlei Yu 2022, 21-23+80.)

Finnish marketing experts published the view of " customer perceived service quality " in 1982, and believed that customers evaluate service quality by comparing the actual feelings in the service with the expectations before the service : if the actual feeling is satisfied or even exceeds the expectation, then the customer feels high quality ; on the contrary, the actual feeling did not meet

the expectations. Even if the actual quality is good from an objective point of view, the customer still feels low quality. (Christian Grönroos 2001, 150-152.)

Some scholars have proposed that service is an activity that needs to be bundled with tangible products and can satisfy people and cannot be concretized. (Regan W J 1963, 57-62.)

Some scholars have said in their research that service is an object that cannot be touched. It is not only a process, but also a representation of people 's feelings. (Lovelock C H 1983, 9-11.)

To sum up, domestic and foreign scholars' research focuses on air passenger transportation, while less research is done on air cargo. This paper will focus on SF airlines' cargo service quality evaluation itself, combine methods as well as models, discover various problems, and put forward actionable service quality suggestions for specific problems.

2.2 Determine the research methodology

The SERVQUAL model is used to evaluate the service, focusing on the overall, subjective service evaluation, to evaluate the gap between the expectations of the customer and the perception of the customer's service, and to calculate the specific value of the gap to assess the quality of the service provided by the service provider. Some studies have shown that among the five evaluation dimensions of this model, Chinese consumers have the highest perceptions and requirements for safety, reliability and empathy, i.e., higher expectations in this regard. (Xiucheng Fan & Jiangang Du 2006, 111-118+173.)

SERVPERF does not consider customer expectations of service quality because they are difficult to assess accurately in practice, so the SERVPERF model only evaluates customer perceptions and performance in the process of service delivery, and has been shown in research to be a simple and feasible way to evaluate service quality. In 1990, Carman made a similar argument that the customer's expectations of service quality cannot be accurately judged, and that service quality should only be evaluated by the level of service the customer perceives in the process of being served. (Carman J M 1990, 33-55.)

Since the SERVPERF quality assessment model has emerged and is widely used and recommended, the gap-based SERVQUAL model has been questioned by many researchers on this premise, but more scholars have strongly refuted these questions through actual research. In a 1994 study by PZB, it was stated that the SERVQUAL model provides comprehensive quality assessment information, including specific elements that service providers can see to improve service quality as customer service perceptions and expectations change over time. (Parasuraman A, Zeithaml V & Berry L L 1994, 201-230.)

By reading a lot of literature, learned a lot of evaluation models and steps to use them. Combined with the thesis, the SERVQUAL model is chosen for this study because it shows organized evaluation dimensions, which can provide clearer ideas when making questionnaires, so that this study can consider the construction of evaluation models from multiple angles and dimensions; from the perspective of air cargo, the adjustment of dimensions can provide a more comprehensive understanding of the customer's evaluation of the service, and the survey analysis according to the model and make suggestions to improve the service quality.

2.3 Introduction of research methods

To meet the changing needs of the service market, there are more and more ways to evaluate service quality, and the PZB trio developed the SERVQUAL model (Figure 2), a service quality evaluation scale based on the service quality gap analysis model. The SERVQUAL model has solved the service quality evaluation problem in many industries, and with continuous in-depth research, the SERVQUAL model has been verified to be applicable to service quality evaluation in different industries, and has certain universality. (Maonan Zhao 2021, 7-15.)

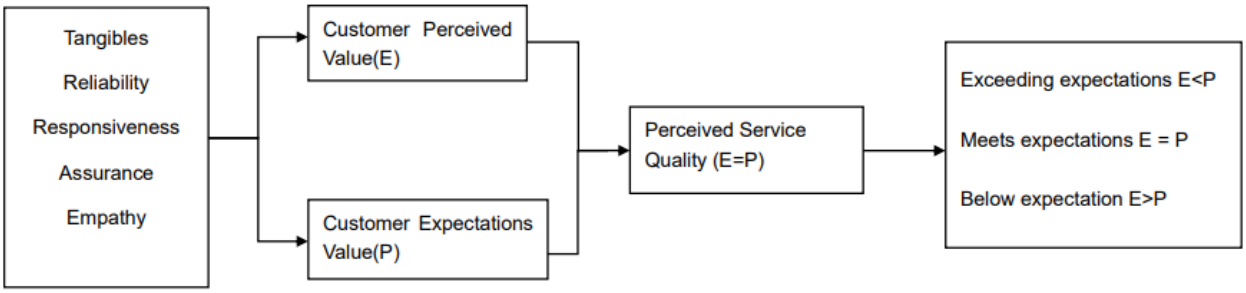

Figure2. SERVQUAL Model Figure

According to the SERVQUAL model evaluation scale, a questionnaire was used to survey and study service companies in various industries, and respondents would rate their expected corporate services on a satisfaction scale from 1 to 5, from highest to lowest. The same for the perceived value of the actual services scored. The difference between the Expectation score and the Perception score is defined as the service quality variation score, and the formula is as follows. (Zhang peng, Enyi Zhou & Junsong Bian 2021, 100-106.):

$$\mathrm{SQ} = E_i - P_i$$

SQ - the overall service quality under the expected perceived differences;

P_i - the mean value of service quality of the i indicator as perceived by the consumer for the actual perception;

E_i - the mean value of service quality of the i indicator expected by the consumer;

SQ > 0 customer perception score is greater than customer expectation score, service quality is high;

SQ < 0 customer perception score is less than customer expectation score, service quality is low;

SQ = 0 both equal, indicating that the service is exactly acceptable.

3 SF Airlines Introduction and Cargo Process

This paragraph introduces SF Airlines and how the air cargo process works.

3.1 SF Airlines Introduction

SF Airlines, the cargo airline of SF, is headquartered in Shenzhen, Guangdong Province, with two other air hubs in Hangzhou and Beijing, and is committed to providing safe and efficient express air transport services and customized air logistics solutions for customers. After years of development and forward-looking strategic layout, SF has gradually formed a comprehensive logistics service network of "SkyNet + GroundNet + Information Network", while SF Airlines is the key force supporting the "SkyNet".

Since SF was established, it has become more and more focused on the improvement of service quality in order to better meet the market demand. The company has established a huge business organization in China (including Hong Kong, Macao and Taiwan) for information collection, market development, logistics and distribution, and express delivery, and a nationwide network to serve customers. In addition to developing domestic business, the enterprise also actively expands international business and opens express business in the United States, Japan, Korea, Singapore, Malaysia, Thailand, Vietnam and other countries. With the rapid development of business, SF's original charter and belly class resources can no longer meet the needs of express transportation. SF established SF Air to continuously enhance its core competitiveness. (Qingxiu Wu 2014, 13-17.)

SF Airlines is the cargo airline operating the largest number of all-cargo aircraft in China, with a fleet of Boeing 747, 767, 757 and 737 all-cargo aircraft, and the fleet size has been growing steadily since its inception. As of February 2023, the number of all-cargo aircraft in operation has reached 78.

SF company’s air transport resources are composed of full cargo aircraft and bulk flight (using passenger aircraft to transport goods in spare warehouse), forming a competitive air transport capacity. In 2009, SF Airlines became the first private cargo airline in China and now has the largest number of cargo airlines in China. Until June 2019, only SF, EMS and YTO have established logistics airlines with independent air transportation capabilities among domestic express companies. SF leads the industry in China in terms of the number of cargo planes, routes and transport capacity. (Donghui Liang 2019, 14-16.)

3.2 Air Cargo Process

Usually, customers who choose air cargo will have higher requirements for cargo transportation than traditional cargo, because customers who use air cargo deliver things of higher value or require faster timeliness, so customers' expectations for air transportation also exceed other traditional transportation methods. Therefore, in the process of air cargo, airlines need to ensure that each step of the service is in place so as to bring customers a good experience, and if there is a problem with one step of the service, it will affect the overall service experience of customers in air cargo. Airlines need to take into account not only the team's service behaviour but also the unseen back office security behaviour of customers. For different customers and different cargo, airlines should develop personalized services to bring customers a better experience, both to ensure customer requirements and to allow customers to experience a more comprehensive service. The air cargo process is shown in Figure 3.

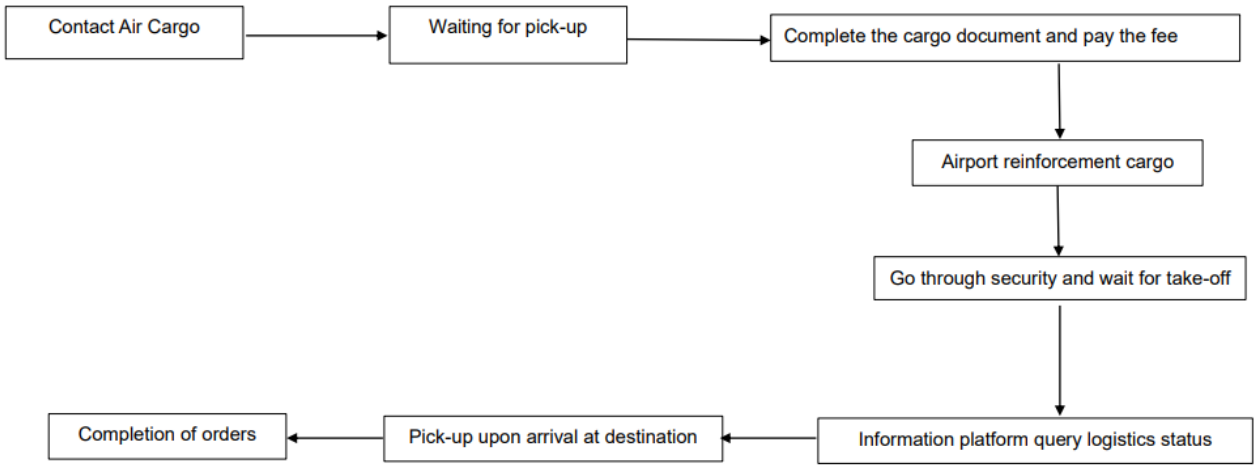

Figure 3. Air cargo flow

4 Method

This paragraph mainly explains the process of SERVQUAL model, and how to use the model to construct the questionnaire, how to distribute and collect the questionnaire after it is set up, and how to conduct reliability and validity analysis for the collected questionnaire to ensure that it is reliable.

4.1 SERVQUAL Model Construction

Firstly, according to the 5 dimensions and 24 secondary evaluation indicators of SERVQUAL model, and then combined with the actual situation of air cargo service quality evaluation, four of these dimensions were selected and two dimensions were added, and then 22 evaluation indicators were developed according to these 7 dimensions. Next, a questionnaire was designed based on these dimensions and indicators. Then, the questionnaires were distributed, and after filling out the questionnaires, the recovery work was performed and the data was compiled. In addition, reliability and validity analysis was conducted based on the recovered data to ensure that the results of the responses truly reflected the expected objectives and that the collected data had analytical value. Finally, the results of the survey are analyzed and explained for each dimension. (Figure 4.)

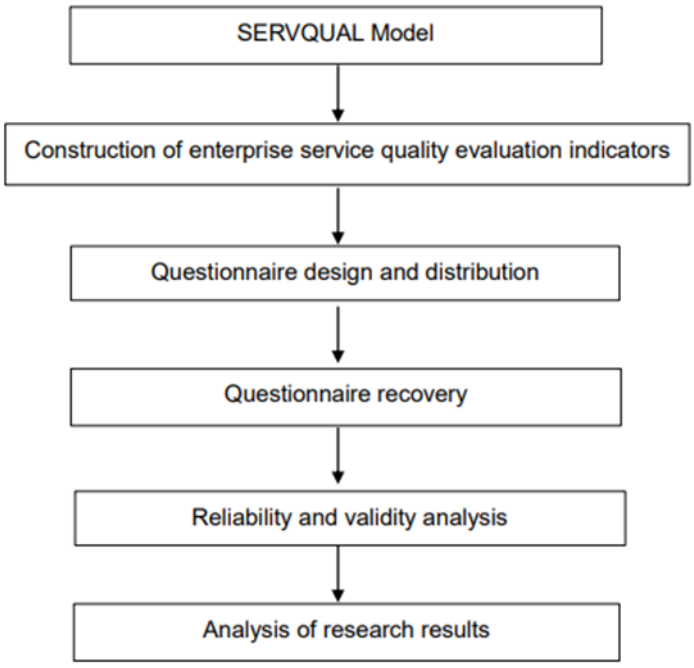

Figure 4. SERVQUAL Flow Figure

4.2 Determining evaluation indicators

Currently, the cargo service quality of SF Airlines needs to be improved. A questionnaire can be constructed by SERVQUAL model for customers to fill in, so as to accurately understand customers' psychological expectation and actual perception, and find the gap through these two conditions, which is also the basis and condition for giving optimization suggestions. For the actual situation of SF Airlines itself, the evaluation indexes will be determined specifically from the following aspects.

1. Evaluation indicator construction principles

Constructing objective, scientific and suitable evaluation indexes for cargo service quality of SF airlines is the premise of evaluating cargo service quality of SF airlines, and the accuracy of evaluation results depends largely on whether the selection of indexes is scientific and comprehensive. (Yongchong Wang 2021)

In order to find the most suitable evaluation indexes, reviewed a lot of relevant literature, combined the construction principles of various scholars, and selected the most suitable ones for combination to ensure the accuracy of the evaluation index principles in order to effectively evaluate the quality of cargo services of SF airlines, and the construction principles are as follows:

- Principle of representativeness. As far as possible, a small number of similar indicators are selected to reflect all the information about the indicators need to be selected through different perspectives to choose appropriate representative key indicators to evaluate multivariate and composite air cargo services. (Xing Jie 2016, 33-38.)

- Scientific principle. Through a lot of study, research related theories and literature as well as SERVQUAL model, and combine with the actual situation of SF airline cargo service quality. Ensure the scientific rationality of the evaluation index when developing it. At the same time, the index should not be unchanging and conformist, it needs to be constantly optimized and upgraded. It is necessary to constantly take the essence and remove the dross, to delete some items that are not in high demand and overlap, and to enrich and supplement novel items in time. This will help customers understand the meaning of the indicators accurately and make the correct evaluation. (Zhang Xin 2022, 14-20.)

- Systematic principle. The service evaluation index system is a unified whole. No single indicator exists independently, and this correlation makes it follow the principle of systemic. In the selection of indicators, not only the quality of service can be evaluated, but also the level of its service level can be presented as a whole. From the perspective of system wholeness, the evaluation index system is constructed so as to form a comprehensive and systematic evaluation index system.

- Principle of coordination. There is a certain relationship between the system indicators, and only through the coordination mechanism can the superiority of the established indicator system be fully demonstrated.

- Principle of economy. In practice it is necessary to consider the project cost from the level of economy. When designing evaluation indexes, it is necessary to consider the enterprise's own economic affordability and be realistic, so as to build a suitable index system. Because although a complex index system can obtain more scientific and comprehensive evaluation results, if the implementation is very complicated and the economic cost is also high, it is difficult to implement and the evaluation will be meaningless. (Huang Wen 2011, 23-30.)

These five principles must be taken into account when developing evaluation indicators. If the problem is considered from the perspective of these principles, it can ensure that the evaluation indicators are meaningful, relatively scientific and comprehensive, and if they deviate from these principles, the evaluation indicators may have some problems.

2. SERVQUAL model specific content

In the selection of initial indicators, Tangibles, Reliability, Responsiveness, Assurance and Empathy (Table 1) are identified as the first level dimensions according to the generalization of SERVQUAL evaluation model, while containing 22 specific connotations, and are uniformly numbered using a five-point Likert scale, for the benefit of service quality quantification and later service quality evaluation. (Zhang Xin 2022, 14-20.)

Table 1. Initial evaluation scale (PZB's SERVQUAL Scale)

Initial SERVQUAL Evaluation Scale	
Dimensionality	**Indicators**
Tangibles	1. Have modern service facilities tangibles
	2. Service facilities are attractive
	3. Employees have neat clothes and appearance
	4. Matching the company's facilities with the services provided
Reliability	5. The company can complete the things promised to customers in time
	6. Care and help when customers encounter difficulties
	7. The company is reliable
	8. To provide the promised services on time
	9. Correctly document the relevant services
Responsiveness	10.Tell customers the exact time of service delivery
	11.Provide timely service
	12. Employees are always willing to help customers
	13. Employees will not ignore customers for other things
Assurance	14. Employees are trusted
	15. Customers will feel at ease when engaging in transactions
	16. Employees are polite
	17. Employees can receive appropriate support from the company to provide better services
Empathy	18. The company provides personalized services for customers
	19. Employees will give individual attention to customers
	20. Employees understand the needs of customers
	21. The company gives priority to the interests of its customers
	22. The company provides service hours that meet the needs of customers

3. Construct service quality evaluation indicators

SERVQUAL evaluation dimensions, combined with the current actual situation of the air cargo industry, the dimensions of Reliability, Responsiveness, Tangibles and Assurance were selected, and the dimensions of Innovation, Information and Economy were added to construct evaluation indicators suitable for air cargo. As shown in Table 2.

SERVQUAL's 5 dimensions are not all appropriate for air cargo Which:

- Reliability refers to whether the service provider can follow the commitment to accurately implement the service in place, put on the level of SF airline cargo service means that the enterprise can provide customers with accurate and timely cargo services, which is actually the core of the entire air cargo service, the enterprise only protects the core, on the basis of which can improve the quality of other services.

- Responsiveness refers to the extent to which the airline can provide customers with the help and convenience they need in a timely manner. For example, customers can check logistics information in a timely manner and customers can get help in a timely manner.

- Tangibles refers to the external performance of the enterprise staff in the face of customers, such as whether the staff is unified clothing, familiarity with the degree of equipment, etc. On the one hand, the unified and orderly service level helps the service-oriented enterprises to carry out services, on the other hand, the enterprise staff is directly facing the customers, which directly reflects the service quality level, so this is also very important.

- Assurance refers to whether the enterprise employees are familiar with their positions and whether they have enough professional knowledge, skills and sense of responsibility to let our customers see the professionalism of the employees when facing problems, and also to ensure the enthusiastic service attitude of the enterprise employees so as to inspire the trust of the customers.

- Innovation refers to the ability of the company to develop diversified solutions according to the characteristics of the task in the face of different customers, to fully consider the variability and extension of customer needs, personalization, and to develop targeted and reasonable economic transport solutions. Consider the customer's perspective and solve the corresponding problems.

- Information refers to whether the enterprise can take the initiative to give feedback to customers at each stage of logistics information, in such as arrow can provide customers with convenient self-help cargo information query services.

- Economy refers to whether the company's own prices are reasonable compared to those of its peers, and whether the prices can match the services.

Table 2. SF airline cargo service quality evaluation system and indicators

Indicator Numbers	Dimensionality	Questionnaire Title
Q1	**Reliability**	The company receives and picks up the goods according to the appointed time.
Q2		The company delivers and dispatches according to the appointed time.
Q3		The company delivered the goods safely and intact.
Q4		The logistics documents and cargo data provided by enterprises are accurate.
Q1	**Responsiveness**	The company accepts cargo requests in a timely manner
Q2		This company is easy and fast to handle cargo business and pick up goods.
Q3		The company complaint channel is open and convenient.
Q4		The company promptly handles complaints and provides improvements and solutions.
Q5		The company handles and follows up on exceptions in a timely manner, providing contingency and alternative solutions.
Q1	**Tangibles**	The company provides customers with reasonable advice and services for crating reinforcement.
Q2		The company provides the logistics documents required to be standardized and clear.
Q3		The company's onsite capabilities are efficient.
Q1	**Assurance**	The company has a clear contact person at the counter.
Q2		The company's employees have a professional knowledge and skill base in logistics services. Quickly and fully understand customers' needs and answer their questions.
Q3		The company's employees are proactive in communicating with customers and have a good and enthusiastic service attitude.
Q1	**Innovation**	The company has a flexible service capability to meet the changing needs of customers.
Q2		The company offers optimized or innovative logistics design solutions for different customers.
Q1	**Information**	The company provides information that accurately reflects the current status and progress of cargo services.
Q2		The company is able to provide timely and rapid feedback on cargo information to customers.
Q3		The company provides convenient self-service cargo information inquiry services.
Q1	**Economy**	The company charges relatively reasonable prices for logistics services.
Q2		The company offers logistic methods that are reasonable and adapted to customer needs.

4.3 Questionnaire design and distribution

The questionnaire design is based on the indicators selected from the above analysis and the SF airline cargo service quality evaluation system constructed on this basis, and the logic and structure of the questionnaire are supported by this hierarchical framework. Taking into account the audience's feeling of answering, the meaning of the indicators was analyzed in depth, and each questionnaire question corresponding to each indicator was established in an easy-to-understand way, and all indicators were scored using the 5-point Likert scale, so that the respondents could make their own evaluation of their true feelings more conveniently and easily according to their own feelings of being served.

1. Questionnaire content

The questionnaire about the quality of cargo service of SF Airlines consists of two parts. Firstly, gender, age, frequency of sending cargo in the last year, these basic information as the first part of the questionnaire. Secondly, the evaluation scale of SF Airlines cargo service quality, which is divided into seven dimensions within the scale, and 22 items are designed through the seven dimensions, and each item within the scale needs to be scored twice for expected service and perceived service.

"Customer Expectations" refers to the level of service that customers want to feel throughout the SF Airlines cargo service. A number from 1-5 indicates the level of service desired, with higher numbers indicating a greater desire to be served. ("1" is very undesirable, "2" is undesirable, "3" is average, "4" is desirable, "5" is very desirable).

"Customer perception" refers to the level of service that customers really feel during the entire SF airline cargo service. The numbers 1-5 indicate the level of service satisfaction, with higher numbers indicating more satisfactory service. ("1" very unsatisfied, "2" unsatisfied, "3" average, "4" satisfied, "5" very satisfied).

2. Questionnaire distribution and collection

The questionnaires were mainly distributed through the Internet, and customers could scan the form QR code to fill in the questionnaires, which could expand the scope of the survey, and were filled in anonymously to ensure the privacy of the respondents. A total of 115 questionnaires were sent out and 112 were returned, of which 112 were valid and the other 3 were invalid due to incomplete completion and other reasons, with a valid recovery rate of 97%. Gender, age, and frequency of shipments in the last year are shown in Table 3, Table 4, and Table 5.

Table 3. Gender Distribution Table

Options	Subtotal	Proportion
Male	41	36.61%
Female	71	63.39%
This question is valid to fill in the number of people	112	

Table 4. Age Distribution Table

Options	Subtotal	Proportion
Under 18 years of age	0	0%
18~25	69	61.61%
26~30	9	8.04%
31~40	12	10.71%
41~50	14	12.5%
51~60	5	4.46%
60+ years old	3	2.68%
This question is valid to fill in the number of people	112	

Table 5. Distribution table of the frequency of shipments for the most recent year

Options	Subtotal	Proportion
Once a week or more	17	15.18%
Once a month or more	58	51.79%
Once a year or more	31	27.68%
Other	6	5.36%
This question is valid to fill in the number of people	112	

The analysis of the questionnaire data will be followed by the statistics, reliability and validity tests of the overall situation of the interviewed customers, to identify the gaps in the quality of SF airlines' cargo services through the gaps in customer expectations and customer perceptions in several dimensions, and to analyze the reasons for them and propose effective improvement suggestions.

4.4 Reliability and Validity Tests

This paragraph is to analyze the reliability and validity of the returned questionnaires to ensure that they are reasonable.

1. Reliability Analysis

The questionnaire data need to be tested for reliability, in order to test for consistency. The Cronbach's alpha coefficient method is used for the test, which is also the most commonly used method at present, and is calculated as follows:

$$\alpha \ = \alpha = [\mathrm{k}/(\mathrm{k}-1)] \ * (1 - (\sum \mathrm{Si\hat{}2})/\mathrm{ST\hat{}2})$$

α - Cronbach's alpha coefficient;

K - total number of question items in the scale;

Si^2 - intra-question variance of the score of question i of the questionnaire;

ST^2 - variance of the total score of all question items in the questionnaire.

As can be seen from the above description, the alpha coefficient evaluates the consistency among the scores of the question items in the scale and is an internal consistency coefficient. A coefficient above 0.8 indicates a good coefficient for the total scale, and 0.7-0.8 indicates that it is within an acceptable range. Coefficients above 0.7 indicate a good coefficient for the subscale, 0.7-1.0 indicates an acceptable coefficient, and 0.6-0.7 indicates an average but barely acceptable coefficient. If the coefficients are below 0.6 the questionnaire needs to be reformatted. The SPSS26.0 was used for this reliability test. The results are shown in Table 6.

Table 6. Reliability Analysis

Dimensionality	Title Range	Total questions	Cronbach's α coefficient of customer expectations	Cronbach's α coefficient of customer perception
Reliability	Q1-Q4	4	0.854	0.873
Responsiveness	Q1-Q5	5	0.925	0.912
Tangibles	Q1-Q3	3	0.895	0.833
Assurance	Q1-Q3	3	0.907	0.894
innovation	Q1-Q2	2	0.901	0.837
Information	Q1-Q3	3	0.916	0.877

According to the above reliability analysis, the Cronbach's α values of both customer expectations and customer perceptions are above 0.8, and the α values of all 7 dimensions are greater than 0.8. The range of reliability coefficients is between 0 and 1, and the closer to 1, the higher the reliability. From the above figure, it can be seen that the reliability of this survey result is relatively high.

2. Validity Analysis

Validity analysis is the degree to which the thing being tested can be detected by a measurement tool or instrument. KMO is used to compare the bias correlation coefficients between variables, and the strength of correlation is positively correlated with the KMO value. Bartlett's spherical test, based on the correlation number matrix, and a significance score of less than 0.05 indicates that there is a strong correlation between the variables.

This validity analysis was conducted by SPSS 26, and the results in Table 7 and Table 8 were obtained by testing the customer expectations and actual perceptions of the questionnaire results, respectively. It can be seen that the overall KMO values are all greater than 0.9, while the significance is all 0, which is suitable for factor analysis.

Table 7. Customer expectation test results

KMO sampling appropriateness quantity		0.926
Bartlett's sphericity test	Approximate chi-square	2742.681
	Degree of freedom	231
	Significance	0.000

According to the results of the above analysis, 0.926 is the result of the KMO test coefficient. The coefficient of the KMO test should take a value between 0 and 1 is a more normal range, if the questionnaire is more effective the closer it is to 1.

According to the significance of Bartlett's spherical test also indicates that the significance of the test is infinitely close to 0, so the questionnaire has a good effect.

Table 8. Customer perception test result

KMO sampling appropriateness quantity		0.941
Bartlett's sphericity test	Approximate chi-square	2282.773
	Degree of freedom	231
	Significance	0.000

According to the results of the above analysis, 0.941 is the result of the KMO test coefficient. The coefficient of the KMO test should take a value between 0 and 1 is a more normal range, if the questionnaire is more effective the closer it is to 1.

According to the significance of Bartlett's spherical test also indicates that the significance of the test is infinitely close to 0, so the questionnaire has a good effect.

5 Results

This paper analyzes 7 dimensions and 22 indicators of service quality gaps, and analyzes the causes of these gaps for each dimension, and then proposes improvement suggestions based on these causes to improve the quality of SF air cargo services.

5.1 Service quality disparity analysis of 7 indicators

According to the SERVQUAL service quality evaluation method, the overall perceived service quality is calculated by the formula:

$$\mathrm{SQ} = P_i - E_i$$

SQ - customer perceived service quality;

P_i - the score of the i question item in terms of customer perceptions;

E_i - the score of the i question item in terms of customer expectations;

All values are kept in two significant digits.

According to this formula, it can be calculated that:

SQ= (3.98-4.46) + (3.75-4.47) + (3.91-4.41) + (3.95-4.51) + (3.70-4.29) + (3.88-4.39) + (3.77-4.29)

=-3.88 < 0

From the model, if SQ > 0, it means that the actual perception of customers is higher than expectation and they are more satisfied with this service; if SQ= 0, it means that the actual perception of customers is the same as expectation and this service meets the expectation of customers; if SQ < 0, it means that the actual perception of customers is lower than expectation and they are not satisfied with this service.

According to the above analysis, it can be seen that in the actual service, customers are not satisfied and there are still some problems that need to be improved, which require to conduct a detailed analysis to find where the problems exist and make effective suggestions for optimization.

The expected mean scores, perceived mean scores, and respective gap scores for the seven dimensions are shown in Table 9 and Figure 5 below.

Table 9. Customer expectations and perceptions, gaps

Dimensionality	Expected Average Points	Perceived Average Points	Disparity Points
Reliability	4.46	3.98	-0.48
Responsiveness	4.47	3.75	-0.72
Tangibles	4.41	3.91	-0.50
Assurance	4.51	3.95	-0.56
innovation	4.29	3.70	-0.59
Information	4.39	3.88	-0.51
Economy	4.29	3.77	-0.52

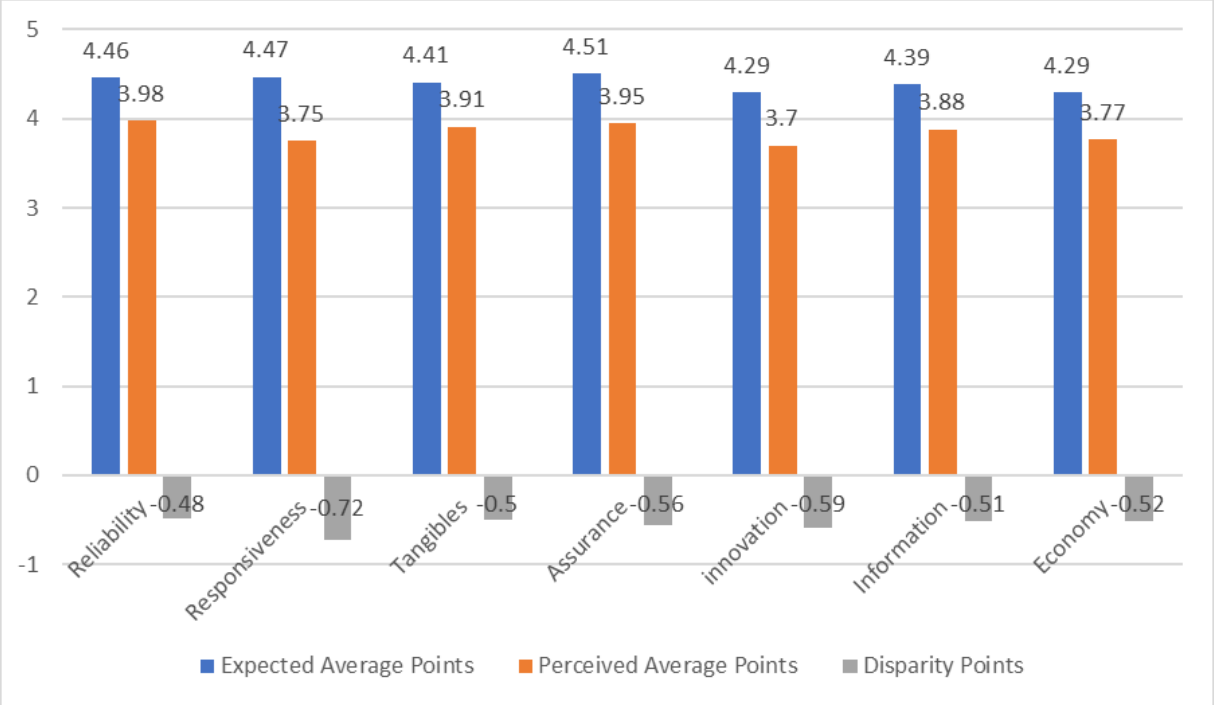

Figure 5.

From the above table, it can be seen that, on the one hand, customers have the highest mean score for assurance with 4.51, while reliability and responsiveness are not very different, Tangibles and Information are not very different, Innovation and Economy have the same score and the low-est mean score. In summary, customers have high expectations for Reliability, Responsiveness, Tangibles, Assurance and Information in SF air cargo service quality.

On the other hand, reliability has the highest mean score of 3.98 in customer perception, while Responsiveness, Innovation, and Economy have lower mean scores, all below 3.8. This shows that customers' perceptions of Responsiveness, Innovation, and Economy in SF Airlines' cargo service quality are not very high, especially Innovation.

In addition, from the overall situation of the 7 dimensions, firstly, Responsiveness has the largest gap with a gap score of -0.72, followed by Assurance and Innovation with a gap score of about 0.57, then Tangibles, Information and Economy with a gap score of about 0.51, and finally Reliability with a gap score of 0.48. This indicates that the main sources of the perceived gap in SF airline cargo services are Responsiveness, Innovation, Assurance and Economy, the four dimensions of Innovation, Assurance, and Economy are improved; the dimensions of Reliability, Tangibles, and Information are appropriately improved on the basis of maintaining the existing services.

5.2 Service quality disparity analysis of 22 indicators

The expectation, perceived average score and gap scores of the 22 indicators are shown in Table 10 below. It can also be viewed in Appendix 1.

Table 10. Service quality scores and gaps for 22 indicators

Indicator Numbers	Dimensionality	Questionnaire Title	Expected Average Points	Perceived Average Points	Disparity Points
Q1	Reliability	The company receives and picks up the goods according to the appointed time.	4.52	3.96	-0.56
Q2		The company delivers and dispatches according to the appointed time.	4.48	3.97	-0.51
Q3		The company delivered the goods safely and intact.	4.44	3.84	-0.60
Q4		The logistics documents and cargo data provided by enterprises are accurate.	4.40	4.13	-0.27

Q1	Responsiveness	The company accepts cargo requests in a timely manner	4.50	3.95	-0.55
Q2		This company is easy and fast to handle cargo business and pick up goods.	4.50	3.73	-0.77
Q3		The company complaint channel is open and convenient.	4.48	3.70	-0.78
Q4		The company promptly handles complaints and provides improvements and solutions.	4.47	3.75	-0.72
Q5		The company handles and follows up on exceptions in a timely manner, providing contingency and alternative solutions.	4.40	3.60	-0.80
Q1	Tangibles	The company provides customers with reasonable advice and services for crating reinforcement.	4.38	3.93	-0.45
Q2		The company provides the logistics documents required to be standardized and clear.	4.43	3.87	-0.56
Q3		The company's onsite capabilities are efficient.	4.42	3.92	-0.50
Q1	Assurance	The company has a clear contact person at the counter.	4.47	3.83	-0.64
Q2		The company's employees have a professional knowledge and skill base in logistics services. Quickly and fully understand customers' needs and answer their questions.	4.47	3.88	-0.59

Q3		The company's employees are proactive in communicating with customers and have a good and enthusiastic service attitude.	4.58	4.13	-0.45
Q1	Innovation	The company has a flexible service capability to meet the changing needs of customers.	4.29	3.73	-0.56
Q2		The company offers optimized or innovative logistics design solutions for different customers.	4.28	3.67	-0.61
Q1	Information	The company provides information that accurately reflects the current status and progress of cargo services.	4.39	3.89	-0.50
Q2		The company is able to provide timely and rapid feedback on cargo information to customers.	4.35	3.86	-0.49
Q3		The company provides convenient self-service cargo information inquiry services.	4.44	3.90	-0.54
Q1	Economy	The company charges relatively reasonable prices for logistics services.	4.29	3.71	-0.58
Q2		The company offers logistic methods that are reasonable and adapted to customer needs.	4.29	3.83	-0.46

According to the analysis of the above table, the highest mean score of 4.58 is obtained for the Q3 (The company's employees are proactive in communicating with customers and have a good and enthusiastic service attitude) in the Assurance section of the Customer Expectations section; Secondly, the mean value of Q1 (The company receives and picks up the goods according to the agreed time) score in Reliability is 4.52; Finally, the lower mean values in Customer Expectations are Innovative Q1, Q2 (The company has a flexible service capability to meet the changing needs of customers; The company offers optimized or innovative logistics design solutions for different customers) and Economic Q1, Q2 (The company charges relatively reasonable prices for logistics services; The company provides reasonable logistics methods and adapts to customer needs) with mean values of 4.28 and 4.29.

Through the above analysis, it can be seen that customers have relatively high expectations for Q3 in the Assurance dimension and Q1 in the Reliability dimension; while they have relatively low expectations for Q1 and Q2 in the Innovation dimension and Q1 and Q2 in the Economy dimension; and have corresponding expectations for each indicator in other dimensions. As shown in Figure 6 and Table 11.

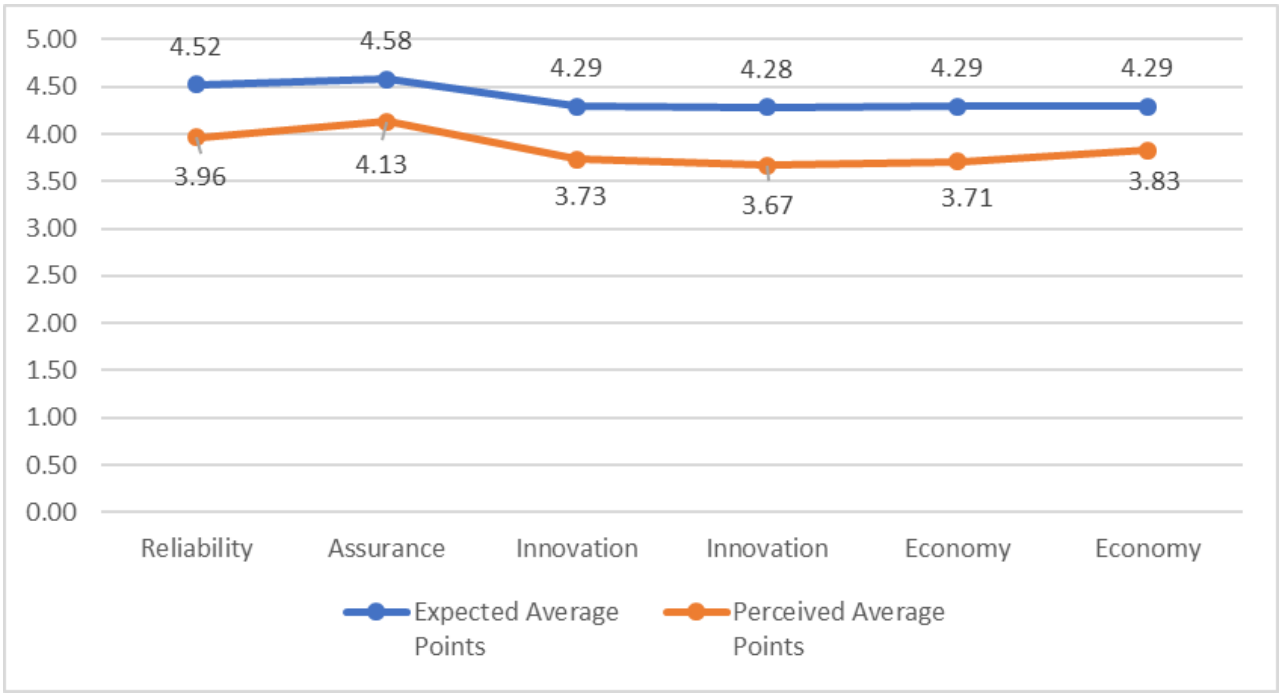

Figure 6.

Table 11.

Indicator Numbers	Dimensionality	Questionnaire Title	Expected Average Points	Perceived Average Points	Disparity Points
Q1	Reliability	The company receives and picks up the goods according to the appointed time.	4.52	3.96	-0.56
Q3	Assurance	The company's employees are proactive in communicating with customers and have a good and enthusiastic service attitude.	4.58	4.13	-0.45
Q1	Innovation	The company has a flexible service capability to meet the changing needs of customers.	4.29	3.73	-0.56
Q2	Innovation	The company offers optimized or innovative logistics design solutions for different customers.	4.28	3.67	-0.61
Q1	Economy	The company charges relatively reasonable prices for logistics services.	4.29	3.71	-0.58
Q2	Economy	The company offers logistic methods that are reasonable and adapted to customer needs.	4.29	3.83	-0.46

The average customer expectation scores of 18 indicators in the five dimensions of Reliability, Responsiveness, Tangibles, Assurance, and Information exceeded 4.35, indicating that customers have relatively high expectations for the vast majority of indicators in these five dimensions and need to pay special attention in the actual service and give more consideration to improving the service.

According to the above analysis, Q4 (The logistics documents and cargo data provided by enterprises are accurate) in Reliability and Q3 (The company's employees are proactive in communicating with customers and have a good and enthusiastic service attitude) in Assurance have the highest mean value of 4.13; followed by Q1, Q2 (The company receives and picks up the goods according to the agreed time; The company delivers and dispatches according to the agreed time) in Reliability and Q1 (The company accepted cargo requests in a timely manner) in Responsiveness with mean values between 3.95 and 3.97; finally, Q3 and Q5 (The company's complaint channels are open and convenient; The company handles and follows up on exceptions in a timely manner, providing contingency and alternative solutions)in Responsiveness have lower mean values between 3.60 and 3.70 in Customer Perception.

From the above statistics, it can be seen that customers have a relatively high perception of Q1, Q2, Q4 in Reliability, Q1 in Responsiveness and Q3 in Assurance; while Q3 and Q5 in Responsiveness have a relatively low perception compared to other indicators; all other dimensions also have corresponding perception indices. As shown in Figure 7 and Table 12.

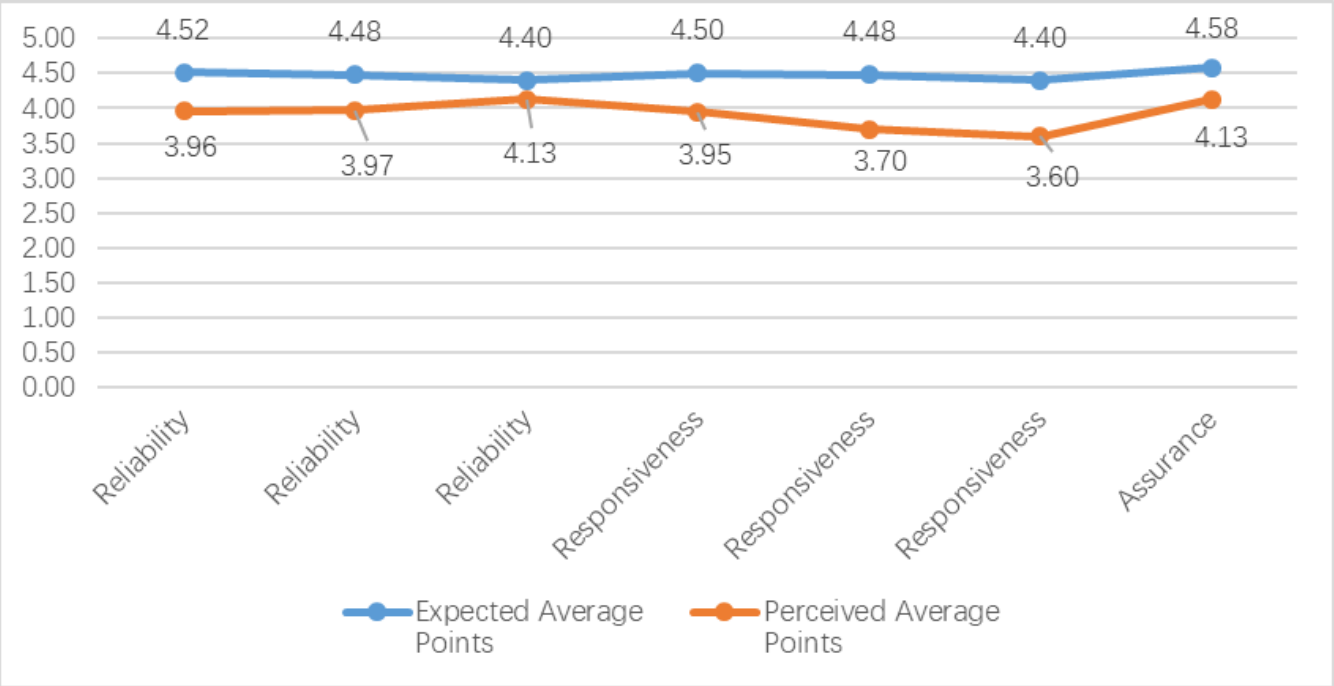

Figure 7.

Table 12.

Indicator Numbers	Dimensionality	Questionnaire Title	Expected Average Points	Perceived Average Points	Disparity Points
Q1	Reliability	The company receives and picks up the goods according to the appointed time.	4.52	3.96	-0.56
Q2	Reliability	The company delivers and dispatches according to the appointed time.	4.48	3.97	-0.51
Q4	Reliability	The logistics documents and cargo data provided by enterprises are accurate.	4.40	4.13	-0.27
Q1	Responsiveness	The company accepts cargo requests in a timely manner.	4.50	3.95	-0.55
Q3	Responsiveness	The company complaint channel is open and convenient.	4.48	3.70	-0.78
Q5	Responsiveness	The company handles and follows up on exceptions in a timely manner, providing contingency and alternative solutions.	4.40	3.60	-0.80
Q3	Assurance	The company's employees are proactive in communicating with customers and have a good and enthusiastic service attitude.	4.58	4.13	-0.45

The average customer perception scores of 14 indicators in the 7 dimensions of Reliability, Responsiveness, Tangibles, Assurance, Innovation, Information, and Economy did not exceed 3.90. This indicates that most of the indicators in these 7 dimensions have relatively low customer perceptions, and companies need to improve these aspects in the actual service.

According to the analysis of the above table, it can be seen that the gap score of Q4 (The company provides accurate logistics documents and cargo data) in Reliability is -0.27 in the expectation and perception gap of each indicator, combined with the customer expectation score, which means that the actual perception of this indicator is not much different from the expectation, indicating that the customer experience is acceptable, but there are some problems. Then there is the biggest gap between the expectation and perception of Q2, Q3, Q4, Q5 (This company is easy and fast to handle cargo business and pick up goods; The company complaint channel is open and convenient; The company promptly handles complaints and provides improvements and solutions; The company handles and follows up on exceptions in a timely manner, providing contingency and alternative solutions) in Responsiveness, followed by the big gap between the expectation and gap of Q3 (The company delivered the goods safely and intact) in Reliability, Q1 (The company has a clear contact person at the counter) in Assurance and Q2 (The company offers optimized or innovative logistics design solutions for different customers) in Innovation. As shown in Figure 8 and Table 13.

Figure 8

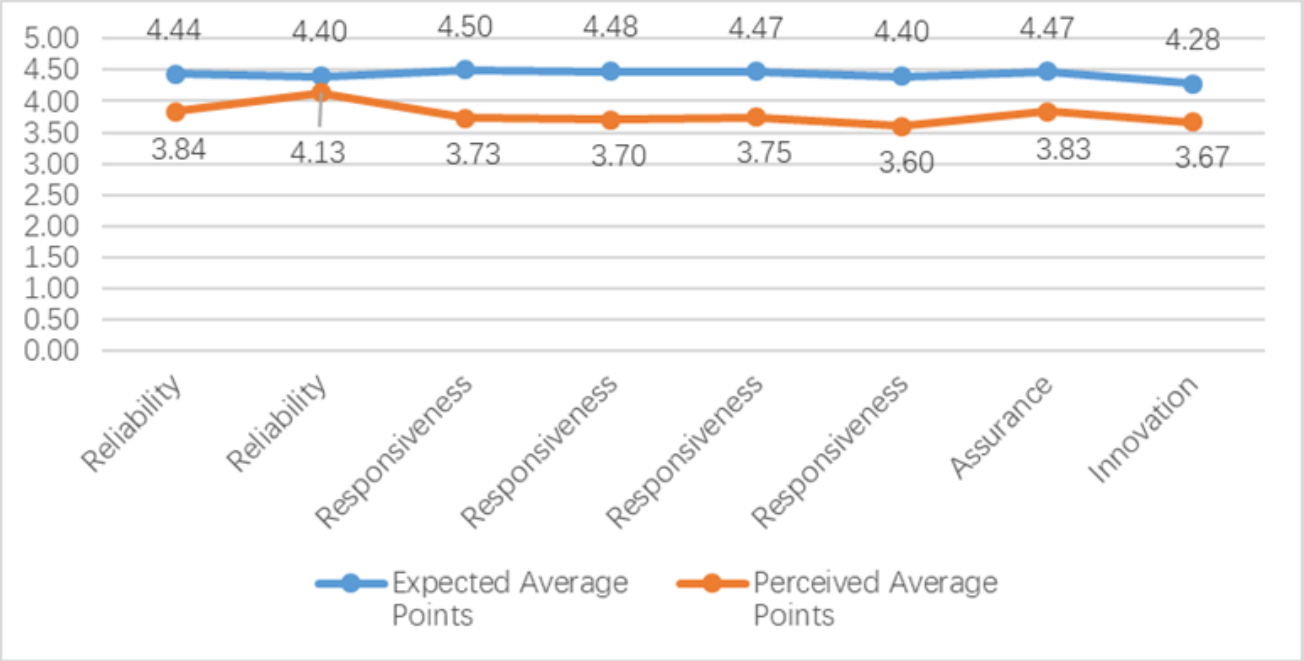

Table 13.

Indicator Numbers	Dimensionality	Questionnaire Title	Expected Average Points	Perceived Average Points	Disparity Points
Q3	Reliability	The company delivered the goods safely and intact.	4.44	3.84	-0.60
Q4	Reliability	The logistics documents and cargo data provided by enterprises are accurate.	4.40	4.13	-0.27
Q2	Responsiveness	This company is easy and fast to handle cargo business and pick up goods.	4.50	3.73	-0.77
Q3	Responsiveness	The company complaint channel is open and convenient.	4.48	3.70	-0.78
Q4	Responsiveness	The company promptly handles complaints and provides improvements and solutions.	4.47	3.75	-0.72
Q5	Responsiveness	The company handles and follows up on exceptions in a timely manner, providing contingency and alternative solutions.	4.40	3.60	-0.80
Q1	Assurance	The company has a clear contact person at the counter.	4.47	3.83	-0.64
Q2	Innovation	The company offers optimized or innovative logistics design solutions for different customers.	4.28	3.67	-0.61

Once again, it proves, the dimensions of Reliability, Responsiveness, Assurance, and Innovation are the main reasons for the gap in the quality of cargo services of companies.

5.3 Analysis of the reasons for the quality gap of SF airline cargo services

Based on the analysis in the previous section, this paper has basically identified the gaps in the quality of SF airline cargo services and the customer expectations and perceptions in each dimension. And as can be seen in the chart above, there are relatively large gaps in the customer's perception of multiple metrics across multiple dimensions, so in order to develop more effective and targeted recommendations, the company will combine the gaps in each metric to identify the causes.

1.Reliability Disparity Cause Analysis

Reliability is mainly whether SF airlines can provide accurate and timely services to customers in cargo transportation and whether they can ensure the integrity of the goods and the accuracy of the logistics bill number when delivering the goods. Reliability, as the most basic function and core competitiveness of enterprises providing logistics services, is also one of the most important dimensions of the entire cargo service. It mainly includes the agreed time with customers for pickup, receipt, delivery and dispatch, as well as the safety of the goods during the whole logistics process and the authenticity of the relevant documents provided to customers. Then the reasons for the reliability gap may be the following:

- The cargo of some routes may be less in quantity, and the planned time cannot be shipped according to the original time due to insufficient supply of goods, and it is necessary to wait for the cargo to reach a certain quantity before it can be sent out, which leads to the delay of shipping time. The same delay in delivery time will lead to the corresponding delay in harvesting and dispatching, which greatly affects the customer's perception. Another situation is that air transportation may be affected by uncontrollable factors, such as weather and other reasons leading to flight cancellation and delays, and these situations can lead to time delays.

- The development of the company's domestic and international sites is unbalanced, and there are unstable factors in the service. After the goods arrive at the relevant airport, it is impossible to arrange customs clearance and delivery immediately, resulting in the delivery service not being carried out according to the planned time. Of course this situation exists only in a few airports.

- In the process of aircraft transport resulting in damage to goods is relatively rare, most cases are in ground transportation or staff in the delivery of goods on the aircraft, unloading the existence of the goods will be damaged, some damaged goods were not found in time, sent to customers when the customer found the damage, affecting customer perception.

2. Responsiveness Disparity Cause Analysis

Responsiveness refers to how SF Airlines resolves and gives feedback to customers in the face of special situations, and is one of the important factors in the customer's evaluation of the service. This dimension includes timely acceptance of cargo requests, fast procedures, handling of complaints and solutions to unusual situations. Then the reasons for the responsiveness gap may be the following:

- When facing the situation of more orders, the staff may not accept the shipment request in time. When customers place and pick up orders, there may be complicated procedures for placing orders, and customers need to fill in a lot of information and data before shipping, resulting in a poor experience.

- The company's channels to receive complaints from customers and the fluency in handling complaints are not perfect. Logistics is a strong service work, directly contact and contact with customers exist. Customers generally complain about the loss of goods, damage, delayed transport time, etc., mainly by the staff of each link to follow up and feedback. However, in reality, these problems involve more links and cannot be well tracked to a specific link, resulting in customer complaints not being effectively improved. The company does not specify a good standard for complaints to be implemented, or there are still some difficulties in implementation.

- There may be some abnormal situations in the transportation link, or some customer requirements will have some special circumstances, the enterprise for these special circumstances is not much consideration, not able to proactively do some countermeasures and plans, or the prepared program is not effective in solving the substantive problems of customers. The customer feels that the company simply notified of the problem and did not take effective measures, resulting in losses.

3. Tangibles Disparity Cause Analysis

Tangibles are the services provided by SF airlines in the delivery of cargo, where the customer can visually see the capabilities of the company's field operations and the specifications of some documents. So the reasons for the tangibles gap may be the following:

- Customers require reinforced goods are not handled properly, and there is no clear understanding of what kind of standard should be reinforced for some special goods. Air cargo is stricter about the weight requirements, the weight of the goods itself is not a problem, but because of the reinforcement caused by overweight will have some problems.

- When customers hand over the cargo, there are some problems with the field operation ability of the staff, and the logistics documents provided by the enterprise may be unclear or not standardized, which makes it difficult for customers to read.

4. Assurance Disparity Cause Analysis

Assurance means that the services provided have the guarantee of quality, and the staff has good service attitude and professional service ability through regular training as well as staff to continuously improve the service quality. Therefore, there are several possible reasons for the existence of the assurance gap.

- Air cargo formation of the market compared to other logistics for a shorter period of time, employees do not have a lot of relevant experience and expertise in the reserves, most of the existing business, and then the model of the process, in the actual business of gradual improvement and learning. With the gradual increase of business, there will be some new employees joining, and it will take time to learn to adapt to the work, there will be some problems that affect the customer perception. The needs of customers are also gradually improving, and SF Airlines employees need to continuously attend training and be exposed to new expertise to better improve their service capabilities.

- In practice, employees may not be able to communicate well with customers, thus resulting in a poor customer experience, and there is a poor sense of service among employees, who have a bad attitude when contacting customers, are not proactive enough to solve problems, and do not consider problems from the customer's point of view.

5. Innovation Disparity Cause Analysis

Innovation means that the company has the awareness of active service, adopts some personalized services to meet the needs of different customers, enriches the service content and provides comprehensive logistics solutions. The main reasons for the formation of this dimensional difference are the following.

- With the progress of the times, the use of air cargo customers is gradually increasing, and the demand for cargo services, content and methods are constantly changing. Customer demand is growing faster and faster, and the standardized solutions introduced by companies are far from the growth rate of customer demand. This has led to some customers' individual needs not being met.

- The company maintains the current situation, on the one hand, with no more choices of routes and aircraft, and on the other hand does not integrate its resources, expand its strengths, develop differentiated and innovative solutions, and implement new programs to extend its service scope and timeliness further. Lack of some innovative awareness and implementation ability.

6. Information Disparity Cause Analysis

Information refers to the timely update and accuracy of logistics information, as well as the diversity and convenience of channels through which customers can inquire about logistics information on their own. This dimension is mainly related to whether the cargo information provided by SF Airlines can accurately reflect the progress of cargo transportation, whether it can be accurately fed back to customers, and whether it is convenient and diverse when customers want to inquire about cargo information. The reasons for the differences in this dimension may be the following:

- When goods are delivered by air to the destination airport, on the one hand, each airport operates differently and there may be a situation where information cannot be shared in a timely matter. On the other hand, there may be a situation that the staff cannot update the logistics information in a timely manner.

- For the enterprise information technology is restricted, resulting in the overall transport process visualization is not high. Enterprises passively accept the influence of the general environment and do not take the initiative to seek other solutions with feasibility, such as updating automation equipment, etc.

7. Economy Disparity Cause Analysis

Economy refers to the reasonableness of the price offered by the company compared to the companies in the same industry, and whether the price matches the logistics service. There may be several reasons for the difference in this dimension:

- Cost factors, the cost of air cargo is already higher than other logistics costs, companies will charge higher fees, some customers may feel that the price is no longer within the acceptable range, affecting customer perception.

- After charging the cost, the company should give services that match the price, some customers feel that they serve a relatively high price, but the results and services are not very good, affecting the customer's perception.

5.4 SF airline cargo service quality improvement suggestions

Based on the results of the above-mentioned analysis of the service quality gap, recommendations for improving the quality of SF airline cargo services will be made around these 7 dimensions.

1. Reliability Improvement Suggestions

Reliability is one of the core competencies of SF air cargo services, but also one of the main reasons for the gap between the expectations of customers and the perception of customers, and the reliability of the improvement of whether customers continue to use SF air cargo plays a very important role. Specific improvements can be made from the following aspects:

- Combined with big data, the volume of cargo is predicted to provide a relatively realistic basis and forecast for monthly or even weekly bookings, graded through recommendations, and this information is communicated to customers so that they can choose according to their needs, greatly safeguarding the volume of cargo and facilitating timely delivery. For some extreme weather that cannot be flown, these times are excluded to avoid delays caused by uncontrollable factors.

- Improve site service process and resource integration. Employees should contact with site personnel in advance to inform when the goods will arrive, and make preparations for follow-up work and preplanning. Update node information in a timely manner to ensure that subsequent pickups and deliveries can be made in a timely manner.

- Implement a perfect responsibility system and strengthen the supervision of goods in transit. Generally speaking, the value of goods chosen for air transportation is

relatively high, and once the goods are damaged, it has a great impact on the company, such as reputation and compensation. For the customers, if the goods have problems, the impression of the customers on the goods will be reduced and they may change the logistics service provider. Then in the face of this situation, on the one hand, the company can set up relevant personnel in each site to check the goods, remedy the damaged goods in time and face relevant prevention and solution strategies. On the other hand, for some more easily damaged goods, employees should take them gently when handling them and arrange a suitable position for transportation to avoid some damage as much as possible. In addition, the company can also use some high-tech auxiliary equipment, such as anti-tip and anti-vibration sensors to achieve the effect of monitoring and alerting.

2. Responsiveness Improvement Suggestions

Currently, the actual perception of customers regarding responsiveness as a whole is not highly rated, and there is a large gap between expectations and perceptions of the four indicators involving procedures, complaints, and handling in the face of abnormal situations, so it is vital to improve the service quality of this dimension and enhance customer experience.

- Improve the order placing process. Reduce unnecessary documentary procedures, use automated tools to reduce the probability of manual errors, booking as well as order placement guidelines are clear and easy to understand, and customers can place orders directly through the APP, which is more convenient and greatly enhances customer experience. Using both machine and manual methods to accept cargo requests, avoiding the situation of not processing cargo requests in a timely manner. The machine can directly accept some universal cargo orders, and some more complex and personalized cargo orders will be accepted by human.

- Improve the complaint tracking and handling process. Customers generally complain through the company's customer service, the company's customer service can use the company's internal APP, the corresponding complaints to the corresponding employees, employees must record in the system feedback customer complaint cases and the impact brought about, and record from the receipt of customer complaints until the complaint is completely resolved, involving the employees to take every step of action, the company to develop the corresponding positions or personnel to regularly check the processing process. The company has established the appropriate positions or personnel to regularly check the professionalism and reasonableness of the handling process. In addition, the company

can also set up a suggestion box on the official website, so that customers can post their suggestions or complaints at any time, which can not only get valuable suggestions and see customers' complaints in time, but also increase the number of visitors to the airline's webpage, so that the airline can make full use of the existing network resources to promote itself, and cargo owners can understand the airline better, and build a bridge of communication between the airline and cargo owners. At the same time, the company can arrange some personnel to use the data in the system to analyze those customer complaint cases and focus on which methods so as to avoid some subsequent complaints of similar problems, thus gaining customer trust, reducing customer losses and improving customer perception.

- Improve the mechanism for handling abnormalities. The most effective remedy for anomalies that occur during transportation is for the airline's service personnel to show up on the scene proactively, acknowledge the existence of the problem, apologize and explain to the shipper, and resolve the problem in person. Once a mistake is identified, service personnel must quickly resolve the mistake; a mistake that is not properly resolved can quickly expand and escalate. Service personnel should learn from the remediation process, which not only makes up for service errors and strengthens the connection with cargo owners, but is also extremely helpful for airlines to improve service quality. By tracking the entire remediation process, managers can also identify urgent problems in the service system and correct certain links in time. After dealing with things, relevant personnel need to promptly sort out the reasons for the occurrence of abnormal situations, summarize lessons learned, formulate targeted abnormality handling mechanisms, clarify relevant responsibilities, and guarantee accountability to individuals. When encountering abnormal problems, they should take the initiative to solve them, actively feedback to customers, integrate multiple resources to provide solutions, consider the problems from the customer's perspective, and enhance customer care.

3. Tangibles Improvement Suggestions

Tangible assets are the direct feelings of customers about the service, while the service quality of cargo service personnel will directly affect the corporate image of SF Airlines. These are one of the factors that affect the customer's feeling and need to be improved on the existing basis.

- Increase service professionalism and service standardization. Combined with experience, summarize and organize a professional and high standard degree, with operability and easy to understand detailed operating guidelines, so that employees learn the skills of reinforcement and how to properly reinforce to ensure compliance with standards, thereby improving customer perception.

- Improve the documents. Let customers can clearly see the key information on the logistics documents, and staff also need to improve the efficiency of their own field operations, so that customers can intuitively feel the professionalism of the company and improve customer perception.

4. Assurance Improvement Suggestions

Assurance is through the professional training of staff, smooth cross-departmental collaboration and actively strengthen the communication with customers to ensure service. The survey shows that this part is still some distance away from customer expectations, and with the continuous changes in service content and methods, the communication skills of employees are increasingly demanding, so in the future work people need to continue to optimize

- As the service window of the airline, the appearance of the service staff is the first impression of the airline to the cargo owners. Cargo owners are more willing to warm and generous, understanding service personnel to serve them. An excellent enterprise cannot be separated from a high-quality staff, and a high-quality staff, not the beginning of the enterprise has. It is the result of continuous market-oriented training of employees with the development of the enterprise stage.

- Improve the staff training system and training mechanism. The company should regularly carry out diversified training, including basic job skills and professional knowledge training, but also to expand the knowledge of international trade-related fields, such as English skills, communication skills, and the operation of some high-end machines and so on. The company should encourage more employees to learn from each other, so that new employees can quickly get up to speed, reduce the transition period brings individual service differences, and better serve customers. The company can also carry out regular assessments and give appropriate rewards to outstanding employees to increase their motivation to learn.

- Improve interdepartmental communication mechanism and establish the concept of total quality management. Air cargo as the main body of air logistics transport.

Air cargo agents, air express business is all around the air cargo. If a certain link for some reason leads to express delay or breakage, loss and other phenomena, it cannot make the entire express delivery pieces to reach the hands of customers smoothly, each employee, each link is fully responsible for the cargo service, the formation of a comprehensive quality management of corporate culture is very important. Logistics involves more departments, and problems may require the collaboration of multiple departments to improve, so the communication and collaboration between various departments is particularly important. It can be used to let some personnel rotate each other regularly to fully learn the working mechanism of different positions, so that the communication will be more effective and avoid the wrong transmission of some information.

5. Innovation Improvement Suggestions

Innovation is that the companies satisfy the individual needs of different customers specified differentiated services, from the immediate interests and needs of customers, actively respond to customer needs, develop logistics solutions applicable to customers, from many homogeneous competitions to stand out. This service capability is weak, and it is also particularly important to improve the quality of service in this dimension in the face of customer demand.

- Improve customer care by optimizing customer communication mechanism. In the face of the changing needs of customers, it is necessary to fully communicate with customers and provide tailor-made services for them with the actual situation. For example, some customers transport goods that need to be sold, then airlines can provide these customers with all kinds of business additional services, such as assisting customers in the process of logistics services to promote, provide special introduction to reserve products, advertising at the point of sale and provide goods corresponding logistics support, etc., which is also one of the modes available to air transport enterprises. It allows customers' goods to be better sold, thus enhancing customer perception.

- Use big data and digitalization to tap more customers. SF airlines can make promotional materials about the company and the special services it offers, etc. A copy can be given to every cargo owner who comes to the terminal, or it can be mailed or e-mailed to relevant cargo owners and customers who have business relations with the airline. This will make the cargo owners more aware of the services provided by SF Airlines, and will also play a good role in promoting the company. The company will be able to tap more customers and promote the operation

of the air cargo structure, which is committed to a healthy and sustainable development.

6. Information Improvement Suggestions

Information that mainly includes the ability of customers to check cargo information in time and to ensure the accuracy of information. According to the statistics customers' expectations for information are still relatively high, and with the development of the Internet, the importance of this dimension will continue to increase as customers' requirements for real-time information and quality management of cargo transportation will become higher and higher.

- Provide value-added information service options as much as possible. Install intelligent GPS devices, anti-tilt and anti-vibration sensors, and monitoring equipment on transportation equipment to enable monitoring of railroad cargo in transit. This will provide real-time feedback to the customer about the cargo.

- The development of APP and telephone self-help query, customers can enter the logistics single number will be able to real-time query and master logistics information, but also the goods to each link will automatically send logistics information to the customer's cell phone in the form of SMS, convenient for customers to understand the situation in real time, to protect the transparency of information, but also to reduce the workload of customer service.

7. Economy Improvement Suggestions

Economy refers to whether the price offered by the company is reasonable and whether the logistics model matches the customer's needs. Customers have low expectations of the cargo prices offered by SF airlines, and customers are more objective in thinking that high air cargo prices are acceptable, but need to have matching services to support them. Therefore, the economic improvement is also very important.

- Optimize internal management structure and reduce management costs. For example, customer service, in principle, customer service is responsible for all the customer interface, including from the acceptance of customer commissions to other customer communication, receipt of documents, subsequent invoicing, tracking complaints, etc., but in practice, more often than not, customer service only plays the function of the initial delivery of commission orders, the rest of the case is basically the operator is also the customer service function directly with the customer interface. In the face of some mechanized work can be directly handed over

to artificial intelligence to complete, outlawing unreasonable and insignificant positions and optimize cost control.

- The company can give out some coupons to give back to customers when the cost allows, which can also promote customer consumption. Under the premise of ensuring the quality of service, providing more competitive prices can help improve customer satisfaction, enhance customer loyalty, and can gain will more customers.

The above analysis to optimize the cargo service of SF Airlines can not only solve some problems of SF Airlines cargo service in a targeted way, but also promote the sustainable development of the company.

6 Conclusions

Conclusion is divided into three parts. Firstly, the key results include the answer to the purpose of the study and the conclusion of the whole paper. Secondly, the improvements include what needs to be improved. Finally, the own learning includes what has been learned through this thesis and what to do in the future.

6.1 Key results

1. According to the original five dimensions of SERVQUAL model and the principles of evaluation indicators, Reliability, Responsiveness, Tangibles and Assurance were selected, and three dimensions of Innovation, Information and Economy were added according to the actual situation. A total of 7 dimensions and 22 indicators were made into a questionnaire for investigation.

2. Through the statistical analysis of the returned questionnaires, the four dimensions of Responsiveness, Innovation, Assurance and Economy among the seven dimensions mainly affect the level of service quality perceived by customers; the dimensions of Reliability, Responsiveness, Assurance and Innovation among the 22 indicators mainly affect the level of service perceived by customers. These dimensions listed are the main influencing factors, and there are also some problems in other dimensions.

3. In the future, for poor hardware facilities that affect customer perception, infrastructure should be improved and artificial intelligence devices should be added. For staff mistakes at work that affect customer perception, staff training should be enhanced and professional knowledge should be learned and applied. For customers who need personalized services, the customer communication mechanism should be optimized, more consideration should be given to problems from the customer's perspective, and innovative thinking and capabilities should be improved. For customers with complaints and unexpected situations, responsibilities should be assigned to individuals, actively solving problems and summarizing lessons learned. For customers with price concerns, the company should optimize its internal structure, reduce management costs, and hold some discount activities when conditions permit.

This thesis is based on the SERVQUAL evaluation model, creating a questionnaire, through the analysis of the results of the questionnaire can reflect the strengths and weaknesses of the company has. Based on the analysis of the results, it shows that there are still problems with the quality of SF Airlines' cargo services, and suggestions are made to address the dimensional gaps and to continuously improve and optimize them to bring a better experience and service to customers.

6.2 Improvement

This paper is only a superficial analysis, no in-depth study of the SERVQUAL model, there are still many shortcomings, hope to conduct more complete and rigorous investigation and analysis in the future.

6.3 Own learning

Through this thesis, the author learned about the SERVQUAL model, how to use the model to frame the questionnaire, to be able to better design the questionnaire for what needs to be studied, and how to use SPSS for reliability and validity analysis. Finally, the author also learned something about cargo services by reading a lot of literature and gave some suggestions using the knowledge learned and the results of the SF air cargo service questionnaire. In the future work and study, the author still needs to keep learning professional knowledge and apply more of what was learned to life and work.

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Appendices

Appendix 1. Table 10 Service quality scores and gaps for 22 indicators

Indicator Numbers	Dimensionality	Questionnaire Title	Expected Average Points	Perceived Average Points	Disparity Points
Q1	Reliability	The company receives and picks up the goods according to the appointed time.	4.52	3.96	-0.56
Q2		The company delivers and dispatches according to the appointed time.	4.48	3.97	-0.51
Q3		The company delivered the goods safely and intact.	4.44	3.84	-0.60
Q4		The logistics documents and cargo data provided by enterprises are accurate.	4.40	4.13	-0.27
Q1	Responsiveness	The company accepts cargo requests in a timely manner	4.50	3.95	-0.55
Q2		This company is easy and fast to handle cargo business and pick up goods.	4.50	3.73	-0.77
Q3		The company complaint channel is open and convenient.	4.48	3.70	-0.78
Q4		The company promptly handles complaints and provides improvements and solutions.	4.47	3.75	-0.72

Q5		The company handles and follows up on exceptions in a timely manner, providing contingency and alternative solutions.	4.40	3.60	-0.80
Q1	Tangibles	The company provides customers with reasonable advice and services for crating reinforcement.	4.38	3.93	-0.45
Q2		The company provides the logistics documents required to be standardized and clear.	4.43	3.87	-0.56
Q3		The company's onsite capabilities are efficient.	4.42	3.92	-0.50
Q1	Assurance	The company has a clear contact person at the counter.	4.47	3.83	-0.64
Q2		The company's employees have a professional knowledge and skill base in logistics services. Quickly and fully understand customers' needs and answer their questions.	4.47	3.88	-0.59
Q3		The company's employees are proactive in communicating with customers and have a good and enthusiastic service attitude.	4.58	4.13	-0.45

Q1	Innovation	The company has a flexible service capability to meet the changing needs of customers.	4.29	3.73	-0.56
Q2		The company offers optimized or innovative logistics design solutions for different customers.	4.28	3.67	-0.61
Q1	Information	The company provides information that accurately reflects the current status and progress of cargo services.	4.39	3.89	-0.50
Q2		The company is able to provide timely and rapid feedback on cargo information to customers.	4.35	3.86	-0.49
Q3		The company provides convenient self-service cargo information inquiry services.	4.44	3.90	-0.54
Q1	Economy	The company charges relatively reasonable prices for logistics services.	4.29	3.71	-0.58
Q2		The company offers logistic methods that are reasonable and adapted to customer needs.	4.29	3.83	-0.46

Appendix 2. Questionnaire

SF Airlines Cargo Customer Expectations and Perceptions Survey

Your gender: [Multiple Choice] *

○Male ○Female

Your age: [multiple choice] *

○18 岁以下 ○18~25 ○26~30 ○31~40

○41~50 ○51~60 ○60 以上

Frequency of sending goods in the past year [multiple choice question] *

○Once a week or more

○Once a month or more

○Once a year or more

○Other

"Customer Expectations" refers to the level of service that customers want to feel throughout the SF Airlines cargo service. A number from 1-5 indicates the level of service desired, with higher numbers indicating a greater desire to be served. ("1" is very undesirable, "2" is undesirable, "3" is average, "4" is desirable, "5" is very desirable).

"Customer perception" refers to the level of service that customers really feel during the entire SF airline cargo service. The numbers 1-5 indicate the level of service satisfaction, with higher numbers indicating more satisfactory service. ("1" very unsatisfied, "2" unsatisfied, "3" average, "4" satisfied, "5" very satisfied).

(1) Reliability
1. The enterprise receives and picks up goods according to the agreed time [matrix multiple-choice question] *

	1	2	3	4	5
Customer expectations	○	○	○	○	○
Customer perception	○	○	○	○	○

2. The enterprise delivers and delivers according to the agreed time. *

	1	2	3	4	5
Customer expectations	○	○	○	○	○
Customer perception	○	○	○	○	○

3. The goods delivered by the enterprise are safe and intact. *

	1	2	3	4	5
Customer expectations	○	○	○	○	○
Customer perception	○	○	○	○	○

4. The logistics documents and cargo data provided by the enterprise are accurate and accurate. *

	1	2	3	4	5
Customer expectations	○	○	○	○	○
Customer perception	○	○	○	○	○

(2) Responsiveness

1. The enterprise promptly accepts cargo requests. *

	1	2	3	4	5
Customer expectations	○	○	○	○	○
Customer perception	○	○	○	○	○

2. The enterprise handles cargo business and pick-up procedures easily and quickly. *

	1	2	3	4	5
Customer expectations	○	○	○	○	○
Customer perception	○	○	○	○	○

3. The complaint channels of the enterprise are open and convenient. *

	1	2	3	4	5
Customer expectations	○	○	○	○	○
Customer perception	○	○	○	○	○

4. The enterprise promptly handles complaints and provides improvement measures and solutions. *

	1	2	3	4	5
Customer expectations	○	○	○	○	○
Customer perception	○	○	○	○	○

5. The enterprise promptly handles and follows up on anomalies, providing emergency and alternative solutions. *

	1	2	3	4	5
Customer expectations	○	○	○	○	○
Customer perception	○	○	○	○	○

(3) Tangibles

1. The enterprise provides customers with reasonable packing reinforcement suggestions and services. *

	1	2	3	4	5
Customer expectations	○	○	○	○	○
Customer perception	○	○	○	○	○

2. The logistics documents provided by the enterprise must be standardized and clear. *

	1	2	3	4	5
Customer expectations	○	○	○	○	○
Customer perception	○	○	○	○	○

3. The enterprise's on-site operation capability is efficient. *

	1	2	3	4	5
Customer expectations	○	○	○	○	○
Customer perception	○	○	○	○	○

(4) Assurance

1. The enterprise has a clear window to contact personnel. *

	1	2	3	4	5
Customer expectations	○	○	○	○	○
Customer perception	○	○	○	○	○

2. The employees of this enterprise have a professional reserve of logistics service knowledge and skills, which can quickly and fully understand customers' needs and answer their questions. *

	1	2	3	4	5
Customer expectations	○	○	○	○	○
Customer perception	○	○	○	○	○

3. The employees of the company actively communicate with customers, with a good and enthusiastic service attitude. *

	1	2	3	4	5
Customer expectations	○	○	○	○	○
Customer perception	○	○	○	○	○

(5) Innovation

1. The enterprise has flexible service capabilities to meet the diverse needs of customers. *

	1	2	3	4	5
Customer expectations	○	○	○	○	○
Customer perception	○	○	○	○	○

2. The enterprise provides optimized or innovative logistics design solutions for different customers. *

	1	2	3	4	5
Customer expectations	○	○	○	○	○
Customer perception	○	○	○	○	○

(6) Informational

1. The information provided by the enterprise can accurately reflect the current status and progress of cargo services. *

	1	2	3	4	5
Customer expectations	○	○	○	○	○
Customer perception	○	○	○	○	○

2. The enterprise is able to provide timely and rapid feedback on goods information to customers. *

	1	2	3	4	5
Customer expectations	○	○	○	○	○
Customer perception	○	○	○	○	○

3. The enterprise provides convenient and self-service cargo information query services. *

	1	2	3	4	5
Customer expectations	○	○	○	○	○
Customer perception	○	○	○	○	○

(7) Economy

1. The logistics service prices charged by the enterprise are relatively reasonable. *

	1	2	3	4	5
Customer expectations	○	○	○	○	○
Customer perception	○	○	○	○	○

2. The logistics methods provided by the enterprise are reasonable and suitable for customer needs. *

	1	2	3	4	5
Customer expectations	○	○	○	○	○
Customer perception	○	○	○	○	○