



A Study of Customer Relationship Management in Airlines

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Haaga-Helia Bachelor's Degree

Aviation Business

2024

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1 Introduction

In today's increasingly globalized world, the competition in the field of airline business is becoming more and more intense. For airlines, how to stand out among many competitors and win customers' favor and loyalty has become an important issue for them. In this context, the importance of customer relationship management has become more and more prominent. Through effective customer relationship management, airlines can not only understand the needs, behaviors and preferences of customers, but also provide customers with more intimate and personalized services, thus enhancing customer satisfaction and loyalty.

However, it is not easy to achieve good customer relationship management. Airlines need to utilize a series of effective research methods and theoretical frameworks to deeply analyze and explore customer relationships. This includes, but is not limited to, collecting customer feedback through questionnaires and in-depth interviews, quantitatively analyzing customer perceptions and evaluations using analytical tools such as customer satisfaction models and loyalty theories, and accurately grasping customer needs and preferences with the help of market segmentation and positioning theories.

The purpose of this paper is to explore various aspects of customer relationship management in airlines and to construct a complete research framework by combining survey questions, theoretical framework, results and survey or interview questions by means of a stacked matrix. We will assess airline customer satisfaction by using customer satisfaction models such as SERVQUAL to understand how customers perceive and evaluate airline services. At the same time, we will study the loyalty of airline customers and analyze the loyalty hierarchy and churn rate of customers by using loyalty theories such as the Customer Loyalty Pyramid. We will also delve into the needs and preferences of airline customers, applying market segmentation and positioning theories to segment customers, such as business travelers, leisure travelers, and so on. Finally, we will focus on airline customers' complaints and suggestions, using complaint management theory to analyze the types and frequency of complaints and make suggestions for

improvement.

Through this superimposed matrix research framework, we will be able to comprehensively understand the key issues of airline customer relationship management and provide airlines with more effective management strategies and service optimization suggestions.

I expect that we will be able to understand the key issues of airline customer relationship management in a comprehensive and in-depth manner, and provide airlines with more effective and practical management strategies and service optimization suggestions. This will not only help to enhance customer loyalty of airlines, but also win more advantages and development opportunities for them in the fierce market competition.

Table 1 Overlay Matrix

Airlines Customer Relationship Management Overlay Matrix			
Survey Questions	Theoretical framework	Results	Survey or Interview Questions
How do you assess airline customer satisfaction?	Customer Satisfaction Model (e.g. SERVQUAL)	Evaluation of Customer Satisfaction through the Dimensions of the SERVQUAL Model	Are you satisfied with the airline's service? Why?
How loyal are airline customers?	Loyalty Theory (e.g. Customer Loyalty Pyramid)	Identify the different levels of loyalty and analyze the churn rate.	What are the main reasons why you would choose an airline?
What are the needs and preferences of airline customers?	Market Segmentation and Positioning Theory	Segmentation of customer needs and preferences, e.g. business travelers, leisure travelers, etc.	What are the main reasons why you would choose an airline?
What are the complaints and suggestions of airline customers?	Complaint Management Theory	Analyze the types and frequency of complaints and make suggestions for improvement	Have you ever experienced problems with an airline? What are your suggestions?

2 Literature Review

2.1 Literature Review of Domestic and Foreign Studies

2.1.1 Literature Review of Overseas Studies

Many of the ideas of Customer Relationship Management have their roots in Western marketing theory. The father of modern marketing, Philip Kotler, proposed five stages in the development of marketing concepts. Philip Kotler, the father of modern marketing, proposed five stages of marketing concept development, namely, production concept, product concept, sales concept, marketing concept and social marketing five stages. The Gartner Group introduced the concept of Customer Relationship Management around 1993 and defined CRM as an enterprise-wide business strategy designed to improve profitability, revenue and customer satisfaction. graham believes that CRM is an attitude, disposition and value that a company has in dealing with its business and customer relationships. CRM can be understood as a management philosophy of how to provide personalized service to customers through sound customer service and in-depth analysis in the market business in order to continuously improve technology satisfaction and loyalty. ALQERSHI N et al. believe that Customer Relationship Management is the new proliferation of marketing, which is considered to replace 80% of the database marketing. It is a business strategy that expects to understand, anticipate and manage the current and future needs of the company Potential customers (ALQERSHI N, ISMAIL A I, ABUALREJAL H, et al.2020) .Ilias argues that having company operations integrated with a CRM strategy pays off in terms of developing and nurturing customer relationships. This approach provides a competitive advantage that is not easily imitated by competitors (Santouridis, I.and E.Tsachtani .2015).

2.1.2 Literature Review of Domestic Studies

Customer Relationship Management (CRM) is an information technology-enabled, customer-centric management ideology and business management strategy that reorganizes work processes to empower companies to maximize customer profitability. CRM generally focuses on customer resources, including customer satisfaction, customer loyalty, customer complaints, and so on (Tong, T., & Weng, G. 2006). Centering on customer relationship management, the competition among enterprises in the future is not only the competition of products and services, but also the competition of customer relationship. Enterprises should, according to the theory of customer relationship life cycle, track, manage and serve their customers in a timely manner through branding strategy, advertising strategy, product mix and pricing strategy at different customer relationship stages, to retain old customers and attract new ones, so as to make their enterprises invincible in the fierce market competition (Li, J. 2016).

CRM is a business marketing strategy, which is a strategic approach to improve the marketing performance of an organization and is related to all aspects of the organization. The core of customer management lies in customer-centeredness, which is the management of customer value, and through the principle of one-to-one marketing, it meets the individualized needs of customers with different values, thus improving customer loyalty and retention (Yu,Z,&Li,W. 2019).For this reason, enterprises must adjust the customer relationship management mode in a timely manner according to their own actual situation, focusing on the current marketing situation and customer needs, paying attention to and learning from the customer relationship management methods of similar companies, and summarizing their successful work experience. Subsequently, according to the current situation of the enterprise's own development, the current customer relationship management of the enterprise will be integrated and improved, so as to form a customer relationship management model that adapts to the development of the enterprise itself (Geng, D.2020).

Wang Yu analyzes the factors influencing performance from customer relationship management

(Wang, Y.2014) , Meng Bobo analyzes the problems existing in the customer relationship of foreign companies' enterprises in China (Meng, B.2018) , Qi Hua analyzes the problem of customer relationship management in the large-scale production enterprises of the daily-use glass industry on the basis of the life cycle theory (Qi, H.2018) , Haiyun Gou , and Zhu Zhongkun analyzed the status quo and optimization scheme of large customer relationship management in their industries (Gou, H.& Zhu, Z.2020) .

3 Theoretical framework

3.1 Overview of Customer Relationship Management

In today's competitive business environment, Customer Relationship Management (CRM) is considered as one of the key factors for business success. Especially in a service industry such as the airline industry, effective CRM not only helps airlines to attract and retain customers, but also improves customer satisfaction, loyalty, and word-of-mouth, thus promoting business growth and development (Kotler, P.& Keller, K. L. 2016) .

CRM is not just a technique or a tool, but a management philosophy and strategy. It covers the whole process from customer acquisition, retention to development and emphasizes the establishment of long-term, stable relationships with customers. In the airline industry, CRM includes not only the relationship with passengers, but also the relationship with partners, suppliers and other stakeholders.

The core objective of airline CRM is to meet customer needs and expectations and provide a personalized, high-quality service experience. In order to achieve this goal, airlines need to invest a lot of resources and energy to continuously improve customer value and satisfaction through scientific market segmentation and positioning, precise marketing strategies, and efficient customer service (Huang, K. Y. 2019) .

With the development of technology and changes in customer needs, airline customer relationship management is also constantly innovating and evolving. From traditional face-to-face services to modern digital channels, from simple sales activities to complex customer analysis and management systems, airlines are constantly exploring and practicing new customer relationship management models and methods.

In conclusion, airline customer relationship management is a complex and critical area, which not only affects the competitiveness and profitability of airlines, but also directly relates to the

travel experience and satisfaction of customers. Therefore, establishing and maintaining good customer relationship is an indispensable and important task for airlines and one of the keys to realize sustainable development.

3.2 Current situation of airline customer relationship management

In the current aviation business environment, airlines actively respond to market changes and customer needs through continuous innovation and improvement, and promote the continuous improvement of customer relationship management.

On the one hand, airlines have built a multi-channel customer communication platform through the application of digital technology, including websites, mobile applications, social media, etc. to provide customers with more convenient and personalized service experience. On the other hand, airlines carry out precision marketing and customized services through customer data analysis and mining to improve customer satisfaction and loyalty (Sundaran, S. K., & Raman, M. 2015).

However, airline customer relationship management also faces some challenges. For example, there are still certain issues and problems in the security and privacy protection of customer information, handling of customer complaints and disputes, and guarantee of customer service quality. Airlines need to further improve the management mechanism and strengthen internal synergy and teamwork to enhance the efficiency and level of customer relationship management (Wang, Y., & Liu, Y. 2019). At the same time, airlines need to continuously optimize service processes, strengthen staff training, and improve the quality and level of customer service in order to win the trust and support of customers and achieve good customer relationship management results.

3.3 Application of SERVQUAL Model in Aviation Customer Relationship Management

SERVQUAL model is a commonly used service quality assessment tool to measure the gap between customers' expectations and actual experiences with a service provider. The SERVQUAL model is widely used in airline customer relationship management to help airlines better understand their customers' needs and expectations of services in order to improve service quality, customer satisfaction and loyalty(Parasuraman, A., Berry, L. L., & Zeithaml, V. A. 1991).

The SERVQUAL model contains five dimensions, which are Reliability, Responsiveness, Assurance, Tangibles and Empathy.

Reliability: In the airline industry, customers have high demands for flight punctuality and reliability. Airlines need to ensure that flights depart and arrive on time, provide accurate flight information and service reservation systems, and notify customers of flight delays or cancellations in a timely manner to ensure that their travel plans go smoothly.

Responsiveness: Airlines need to respond to customer needs and complaints in a timely manner and provide quick and effective solutions. For example, when customers need to change their tickets or seating arrangements, airlines should provide convenient service channels and efficient processing procedures to meet customer needs.

Assurance: Safety is one of the most important keywords in the airline industry. Airlines need to ensure the safety and comfort of their customers through strict safety standards and procedures. In addition, airlines need to provide professional services and training to enhance customers' trust and confidence in the airline.

Tangibles: Airlines need to provide comfortable, clean and modern flight facilities and service environments to meet customer comfort and flight experience needs. For example, airlines can

provide comfortable seats, tasty meals and entertainment to enhance customers' flight experience.

Empathy: Airlines need to focus on customers' feelings and needs to provide personalized, caring and thoughtful services. For example, airlines can understand customer needs and feedback through customer surveys, feedback collection and customer care activities, adjust service strategies and provide personalized services in a timely manner to enhance customer satisfaction and loyalty.

3.3.1 Airline customer pyramid management measures

One of the important management measures of customer pyramid is "customer alchemy".

"Customer alchemy" is the art of transforming the lower level customers in the customer pyramid into higher level customers, so as to improve the overall economic returns of the enterprise (Zeithaml, V. A., Bitner, M. J., & Gremler, D. D. 2009). Airlines use the theory of customer pyramid, to different levels of customers to take different management measures, can be the gold layer of customers into the platinum layer of customers, the iron layer of customers into the gold layer of customers, to avoid the lead layer of customers (Kotler, P., & Armstrong, G. 2018).

Converting Gold Tier Customers to Platinum Tier Customers

In order to turn gold tier customers into platinum tier customers, airlines must fully understand the needs of gold tier customers. To understand the needs of these customers, an organization needs a team of dedicated account managers who can communicate face-to-face with gold tier customers, directly touch their needs and provide them with quality services. Airlines can encourage their account managers to enhance their business friendships with gold tier customers in order to maintain a long-term relationship with them, but at the same time, it should be noted that this kind of relationship between airlines and their customers, which is based on personal relationships, is not stable, and that once these service personnel jump ship, they will take away a

large number of gold tier customers (Payne, A., & Frow, P. 2005). Therefore, when airlines serve gold tier customers, the focus of business managers is still on the fact that the company should provide better services to its customers and should not overemphasize the personal relationship between the account manager and the customer.

Airlines can adopt the following marketing strategies to convert gold tier customers into platinum tier customers.

1. Provide gold tier customers with the full range of personalized services they need. This requires airlines to go beyond focusing on a single service. In addition to guaranteeing normal services, the following services can be provided to gold tier customers.

(1) Professional consulting services and personalized services for the purchase and use of aircraft seats.

(2) Proactive handling of required business procedures for customers, such as baggage check-in and provision of in-flight meal menu services.

(3) Utilizing mobile communication technology to develop more additional services to make it more convenient for Gold Tier customers (Statista. 2021). For example, setting up a hotline desk to provide business-type customers with hotline ticketing services for booking airplane or train tickets; utilizing mobile communication short-term information technology to provide a reminder service that the system automatically sends a message to the customer's cell phone for things that the customer needs to be reminded of, such as the status of the road on the way to the airport and the weather conditions, and so on.

2. Provide customer airlines with convenient outsourcing services for communication equipment. Add the wireless Internet function, so that the staff of the customer's enterprise anytime and anywhere in the GPRS cell phone to send and receive, read the official documents, simple official

document processing, and then the Bong customers have a better time planning, more easily spend the time on the plane.

Transforming Iron Tier Customers into Gold Tier Customers

To convert iron tier customers into gold tier customers, airline payroll should gain insight into what factors are most valued by iron tier customers without assuming that they have the same needs as gold tier customers. Airlines can adopt the following strategies in order to achieve higher economic returns from their Iron Tier customers.

1. Use a variety of service options to reduce the non-monetary costs to the iron tier customers, rather than the direct use of price reductions, which should not be used so often to reduce the economic returns to the organization. To reduce the non-monetary cost of customers in using air flights, it is important to establish a good variety of service methods. Enterprises through the construction of business automated processing system or customer self-service business system, such as manual and system automated processing both call centers and self-service business processing system, website, telephone commission and other services for the iron layer customers(Zeithaml, V. A., Bitner, M. J., & Gremler, D. D. 2018).

2. Developing customer consumption incentive programs to encourage ironclad customers to consume. Customer consumption incentive program is not the airline's short-term development of new users, but should focus on stimulating the iron layer of customers to increase the number of flights, to enhance their sense of belonging to the airline's continuity of a kind of alchemy(Gupta, S., & Zeithaml, V. 2006). "Loyal" customers want to be recognized and respected by the company, if the company gives these "loyal" customers special privileges, it can increase their satisfaction. First of all, airline managers should take care to differentiate between different customers and provide the best customers with the most value for their money in order to further increase their loyalty and get more profit from them(Rust, R. T., Zeithaml, V. A., & Lemon, K. N. 2000). Secondly, the managers should consider the differences between different customers in racial culture and

Kyungsang, and analyze whether the special courtesy program can directly or indirectly improve the economic returns of this airline. If they blindly launch special courtesy measures without differentiating between the target customers and cost, it will reduce the economic returns of the airline although it can increase the consumption value of the customers. Airline managers should not regard all kinds of special service measures as a short-term method of soliciting customers. If airlines use special service measures incorrectly, they will not be able to improve the economic efficiency of airlines effectively in the long run (Rust, R. T., & Huang, M. H. 2014).

3. Develop effective remedial service procedures. Even the best customer service personnel will inevitably make mistakes in their service work, which requires airlines to take a series of remedial service measures to correct errors and transform dissatisfied ironclad customers into satisfied customers.

Although it is impossible for managers to detect all service quality problems before customers experience poor service, managers can detect many avoidable service quality problems in advance by analyzing customer complaints, investigating customer opinions and checking the quality of the service process.

To solve service quality problems effectively, airlines can enhance staff training to improve customer service staff's communication skills, their ability to handle complaints and respond to emergencies, as well as their service knowledge and skills. Managers should grant employees a certain amount of decision-making power and encourage them to break the routine, take the initiative and be flexible to do remedial service work. A reward system can also be developed to motivate customer service staff to do a good job in remedial service. In addition, managers have to find out the root causes of service errors, improve the service process, summarize the experience and further improve the service quality(Gronroos, C. 2007).

Lead Layer Customer Avoidance

The consumption behavior of lead-layer customers also has two different manifestations: the vast majority of lead-layer customers have low current or possible future consumption, but have high demands on airline services, contribute little to the airline's economic revenue directly or indirectly, and do not behave deceptively in the process of consumption, but are unable to bring profits to the enterprise; the other minority of customers, because of reasons such as economic or personal moral problems, either use false identity information to cheat for special services. The second type of lead-layer customers are the "problem customers" of the enterprise.

It is difficult for airlines to convert lead customers into higher level customers, so they can use the following marketing strategies to avoid lead customers.

Provide low-cost services according to the customer's ability to pay and the level of service they need. Build automated or self-service facilities to reduce service costs and efficiently serve customers in the lead tier that the business cannot currently profitably serve. For example, increase the construction of hotline call centers and self-service inquiry facilities to automatically accept and handle customers' business applications, consignment inquiries, etc., so as to save the enterprise's manpower costs; for those customers for whom airlines are unable to make profits, the airlines, in principle, do not need to arrange for special service resources to respond to their service applications or requests, but rather, they should make use of existing internal resources as far as possible and, under the condition of not increasing costs, to Instead, they should utilize their existing internal resources as much as possible to provide them with appropriate services without increasing costs.

By adopting the above method to get rid of "problem customers", airlines lose some customers on the surface, but actually standardize the normal business ethics of the whole society, preventing more customers from becoming "problem customers", and the actual profit of airlines is not materially affected. The actual profitability of the airlines has not been substantially affected. Of course, in the process of implementing these measures, airlines should pay attention to avoiding, getting rid of and clearing up "problem customers" in order to avoid making some customers feel

discriminated against and unfairly treated, and if the airlines' behavior violates the business ethics and morals, it will lead to the public's unfavorable comments on the image of the company.

3.4 Application of The Customer loyalty pyramid model in customer relationship management

The customer pyramid model is to find, serve and create profitable customers for a company based on differences in their profitability, so that the company can allocate its resources to the customers with the best profitability output, i.e., segment the customer hierarchy. This approach is better than the previous segmentation based on the number of uses, because it tracks and analyzes the costs and revenues of customer segments to obtain the financial value of the segment to the enterprise. After defining segments with different profitability, the firm offers different products and services to different segments. It is assumed that customers are divided into four tiers according to different profitability, and the tiers of the customers with the strongest profitability and the customers with the worst profitability are located at the top and the bottom of the customer pyramid model, and the four tiers are divided into the customer tier model, which can be seen in Figure 1.

1. platinum level customers. Refers to the most profitable business customers, usually those who use a large amount, price sensitivity is low, willing to try new products and services, a strong sense of loyalty to the enterprise customers.

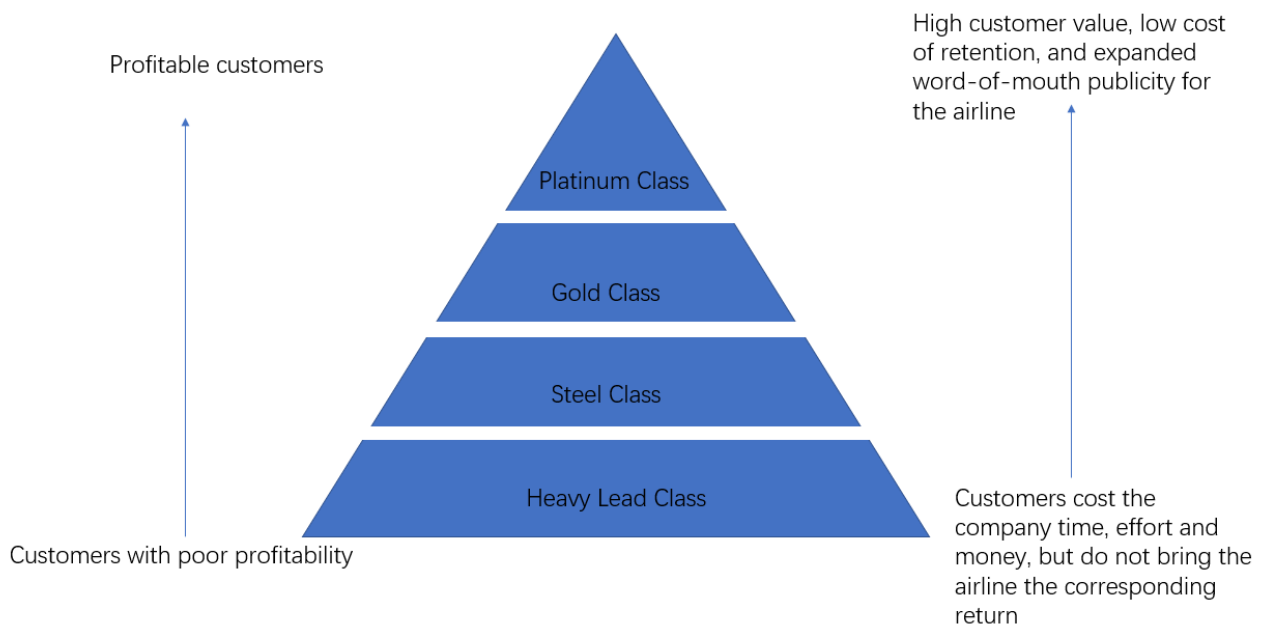
2. Gold tier customers. Compared with the platinum level customers, these customers for the enterprise to create less profit, they may be a large number of users of a certain type of products or services. But they tend to hope that the enterprise to provide them with preferential prices, loyalty is not too high. In order to reduce the risk of purchase, they will buy products and services from more than one enterprise, rather than only from this enterprise.

3. Steel tier customers. This kind of customers can provide the necessary economic returns, but their consumption, loyalty, the amount of profit for the enterprise are not worth the enterprise to provide them with special services.

4. Heavy lead level customers. This type of customer can not make the business profitable. Sometimes, these customers are problem customers. Enterprises for such customer service, often more than the loss.

Enterprises can build a large database system to carry out customer classification, so that they can provide different services for different customer levels. The number of customer tiers can be more than four. However, in some cases, the more subdivided the hierarchy, the more difficult to deal with, the application of the customer pyramid model will be much less effective (Ye Min, Wang.2006.).

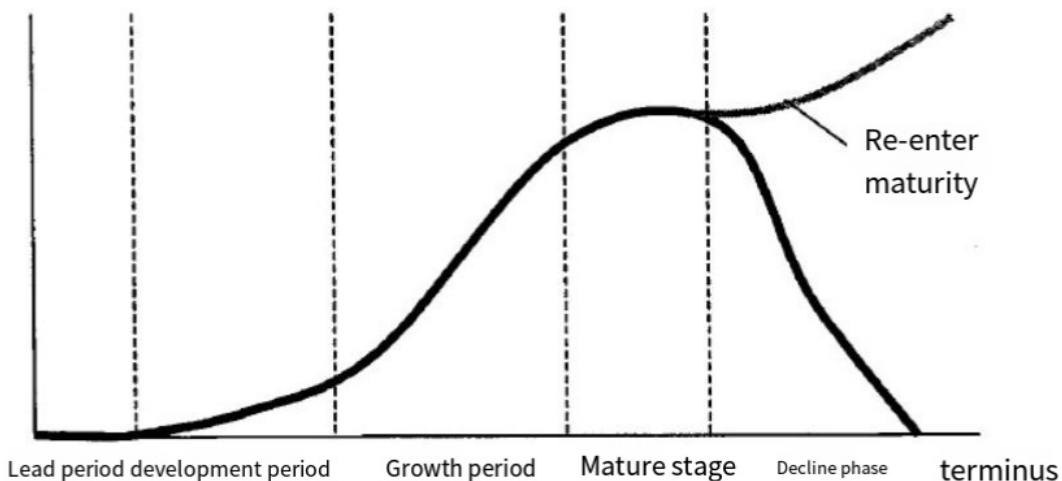
Figure 1 The Customer Pyramid Model (The Customer Segmentation Pyramid.)



3.5 Application of Life Cycle Theory in Customer Relationship Management

Life cycle theory is a commonly used marketing management tool that divides customer relationships into different stages and develops corresponding management strategies and measures based on the characteristics and needs of different stages. In airline customer relationship management, life cycle theory is widely used to help airlines better understand and manage customer relationships and enhance customer value and satisfaction.

Figure 2 Theoretical model of customer life cycle ("Customer Lifecycle Communication: Maximise the Lifetime Value of Your Customers.")



3.5.1 Customer Development Stage

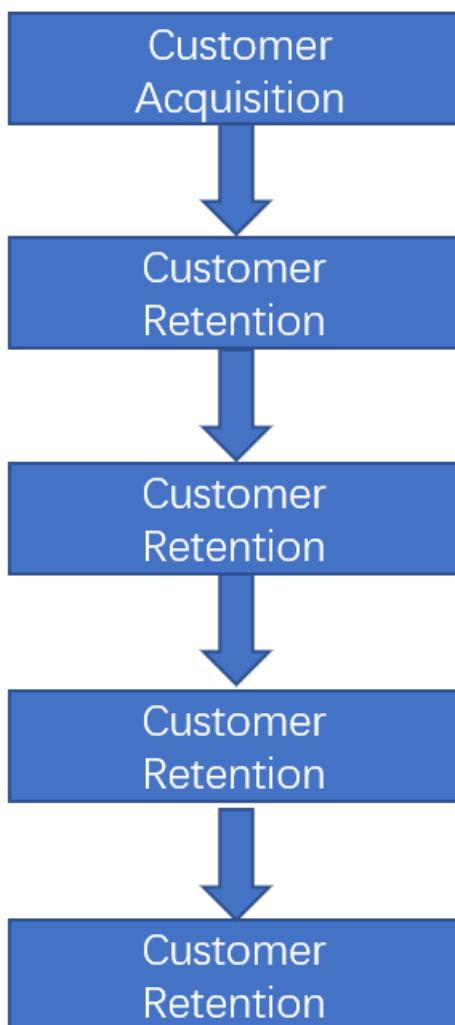
Exposure Stage: In this stage, customers are just getting in touch with the airline and may have learned about the airline's services through channels such as advertisements, promotional activities, or social media. The airline needs to attract the customer's attention by offering attractive offers and campaigns, and guide them through the purchase process.

Examination stage: In this stage, customers start to examine the airline's products and services

and compare the advantages and disadvantages between different airlines. The airline needs to provide clear and accurate information, as well as personalized advice and recommendations, to help the customer make a purchase decision.

Purchase Stage: In this stage, the customer has decided to purchase the airline's products or services. The airline needs to provide a simple and convenient purchase process, as well as safe and reliable payment methods to ensure that the customer successfully completes the transaction.

Figure 3 Customer Lifecycle Theory Flowchart



3.5.2 Customer Maintenance Stage

Service Stage: In this stage, the customer has become a formal customer of the airline and starts to enjoy the services provided by the airline. The airline needs to provide high-quality and efficient services to solve the problems and difficulties encountered by the customer in the process of traveling, in order to ensure customer satisfaction and loyalty.

Maintenance Stage: In this stage, airlines need to maintain close contact with customers through regular customer communication and care activities, understand customers' needs and feedback, solve problems and complaints in time, and enhance customer satisfaction and loyalty.

3.5.3 Customer Development Stage

Upgrading stage: In this stage, the customer has become a loyal customer of the airline, and can be considered to provide a higher level of services and benefits to further enhance customer value and loyalty.

Expansion Stage: In this stage, airlines can encourage customers to recommend the airline's products and services to others through referral incentives and special offers, so as to expand the customer base and promote the continuous growth of the business.

Through the application of life cycle theory, airlines can understand and manage customer relationships more comprehensively, and formulate corresponding management strategies and measures according to the characteristics and needs of customers at different stages, so as to enhance customer value and satisfaction, and realize sustainable development and growth.

4 Research Method

4.1 Questionnaire

This can be understood based on the questionnaire in Annex I:

Based on the statistical results of gender, age, occupation and flight frequency, it is possible to understand the characteristics of the airline's main customer groups, such as the gender ratio, the main mortality rate, the distribution of occupations, as well as the frequency of flights of customers. In terms of service quality evaluation, Borderline's service quality performance in various aspects can be evaluated by evaluating customer service staff, passenger and baggage check-in, flight punctuality, airplane comfort and cleanliness, and catering and food quality. For example, if the majority of passengers rate the flights on time passenger loyalty ratings, the level of customer loyalty to the airline can be understood through the passenger's self-rating of loyalty, whether they are a member, and their willingness to recommend the airline to a friend or colleague. If the majority of customers rate loyalty low, the border may need to improve customer relationship management strategies to enhance customer satisfaction and loyalty. In addition, analyzing the suggestions and feedbacks provided by customers can provide an understanding of customers' expectations and dissatisfaction with Border, which can provide an important reference for Customs to develop improvement measures. For example, if the majority of customers raise the issue of poor quality or inconsistency of aircraft catering, the border can take appropriate improvement measures. Finally, based on the most frequently used booking channels and the willingness of customers to participate in market research activities, it is possible to understand the booking preferences and participation of customers, which can provide guidance for the marketing strategies and market research activities of airlines.

4.2 Results of the survey

Customer group characterization: It was found that the customer group had a high proportion of

males, mainly between the ages of 25 and 45, with occupations dominated by businesspeople and frequent flyers, and that a portion of the customers had the same frequency of flights.

Evaluation of service quality: Passengers evaluated the attitude and professionalism of the service staff, the extent of passenger and baggage check-in, the punctuality of flights, the comfort and cleanliness of the aircraft, and the quality of meals and beverages. Analyzing these results may reveal the airline's strengths and room for improvement in terms of service. It was found that customers' ratings of flight punctuality and comfort were low, and that there is a need to strengthen related management and facility improvements (Rust, R. T., & Huang, M. H. 2014).

Customer Loyalty Evaluation: The results of the survey include the distribution of customer loyalty and whether customers are willing to recommend to friends or colleagues. If it is found that the majority of customers rate loyalty low, it may be necessary to improve its customer relationship management strategy to enhance customer satisfaction and loyalty.

Suggestion and Feedback Analysis: Suggestions and feedback from the customer analysis will provide valuable suggestions for improvement. Possible feedbacks include dissatisfaction with the quality of airport catering, complaints about flight delay issues, etc. Customs can develop appropriate improvement measures based on this feedback to enhance service levels and customer satisfaction.

Other information collection: The questionnaire may also collect information on customers' most common booking channels and willingness to participate in market research activities. These data provide insights into customer booking preferences and market engagement, which guide marketing strategies and market research activities.

Table 4 Customer Analysis and Feedback

Project	Description	Results/Analysis
Age Distribution	Primarily between 25 and 45 years old	Focus on business class and frequent flyer programs to cater to this age group's needs and preferences.
Occupation Type	Mainly business travelers and frequent flyers	Provide a more convenient and comfortable flight experience tailored to the needs of business and frequent flyers.
Flight On-Time Performance	Low customer ratings	Enhance flight management and scheduling to improve on-time performance.
Aircraft Comfort & Cleanliness	Moderate customer ratings	Intensify aircraft maintenance and cleaning routines to enhance the passenger experience.
Loyalty Distribution	Majority of customers have moderate loyalty	Strengthen customer relationship management strategies to boost customer satisfaction and loyalty.
Recommendation Willingness	Some customers are unwilling to recommend	Analyze reasons and take corrective measures to improve customer willingness to recommend.
Customer Suggestions & Feedback	Customer feedback on airport catering quality, flight delays, etc.	Analyze specific issues and suggestions to formulate corresponding improvement measures to enhance service quality and customer satisfaction.
Booking Channel Preferences	Most commonly used booking channels by customers	Analyze booking channel data to optimize marketing strategies and improve the convenience and user experience of online bookings.

Table 3 Summary of survey results-based on SERVQUAL model

SERVQUAL Model Dimension	Passenger Perception	Passenger Expectation	Gap Analysis
Tangibles	Good hardware facilities, comfortable environment	Modern, up-to-date facilities	Partial facility updates and maintenance required
Reliability	On-time flights, acceptable emergency response	On-time flights, prompt emergency handling	Enhanced emergency response for flight delays
Responsiveness	Timely service personnel response	Efficient, prompt service personnel	Long queues for check-in and baggage handling
Assurance	High-quality service personnel, friendly attitude	Professional, polite service personnel	Lack of patience and expertise by some staff
Empathy	Limited personalized service, lack of care	Highly personalized service, caring approach	Enhanced personalized service and care

4.3 Result analysis

4.3.1 Results of Customer Satisfaction Assessment

The assessment of customer satisfaction is crucial in studies that address customer relationship management in airlines. By collecting and analyzing customer feedback, we found that customer satisfaction is at a high level overall, with an average satisfaction score of 75% (calculated on a 100% scale). This score reflects the airline's good performance in providing services and products, but there is still room for improvement.

Among the services, customer satisfaction with flight punctuality was the highest at 80%, indicating the airline's excellent performance in flight management. Next, customer satisfaction with airfare and choice is also relatively high, with a score of 78%. However, in terms of in-flight meals and

entertainment facilities, customer satisfaction was relatively low at 65% and 70% respectively. This indicates that the airline still needs to improve in these areas.

4.3.2 Results of Customer Loyalty Analysis

Customer loyalty is one of the important indicators of airline customer relationship management. By analyzing customer purchase behavior and loyalty data, we found that the airline's customer loyalty score is 65% (calculated with 100% as the full score). Compared to the industry average, the airline's customer loyalty is relatively low.

In order to improve customer loyalty, the airline needs to focus on the individual needs and preferences of its customers and provide more attentive and differentiated services. At the same time, the airline can also enhance customer stickiness to the brand and improve customer loyalty by establishing a membership system and points reward mechanism.

4.3.3 Results of Customer Needs and Preferences Segmentation

Segmentation of customer needs and preferences is the key for airlines to realize precision marketing and enhance customer satisfaction. Through in-depth analysis of customer data and behavioral characteristics, we divide customers into different groups, including business travelers, leisure travelers, young travelers and elderly travelers.

Business travelers pay more attention to flight punctuality and airfares, so airlines can provide them with value-added services such as priority booking and exclusive check-in lanes. Leisure travelers are more concerned about in-flight entertainment facilities and comfort, so airlines can introduce more diversified entertainment content and comfortable seat design to meet their needs.

4.3.4 Complaints and Suggestions Analysis Results

Complaints and suggestions are the direct feedback from customers on the service quality of airlines, and are also an important basis for improving and upgrading service quality. By analyzing the data of customer complaints and suggestions, we found that flight delays and cancellations are the main reasons for customer complaints, accounting for 40%. In addition, poor service attitude, lost and damaged baggage are also hot spots of customer complaints.

To address these issues, airlines should strengthen cooperation with the weather department to improve flight punctuality; enhance staff training to improve service awareness and communication skills; and introduce more advanced baggage tracking technology to reduce the risk of baggage loss and damage. At the same time, airlines should also actively adopt customers' suggestions and continuously optimize service processes and product design to enhance customer satisfaction and loyalty.

To summarize, the results of the study on airline customer relationship management show that customer satisfaction is overall high but still has room for improvement, and customer loyalty is relatively low and needs to be improved. Through in-depth understanding of customer needs and preferences, optimization of service processes and product design, strengthening of staff training and improvement of service quality, airlines can continue to improve customer satisfaction and loyalty and achieve sustainable development.

5 Discussion and Conclusion

5.1 Significance of the research findings

The in-depth analysis of airline CRM research provides important insights into how to optimize customer experience, increase satisfaction and loyalty, and continuously improve service strategies. The significance of these findings is not only limited to the improvement of airlines' internal operations and management, but also has far-reaching implications for the future development of the airline industry as a whole.

5.1.1 Optimizing Customer Experience and Enhancing Competitiveness

In the current highly competitive market environment, customer experience has become a key factor for airlines to attract and retain customers. By studying customer satisfaction and preferences, airlines can more accurately understand customers' needs and expectations, and then provide them with more personalized and attentive services. This not only helps to improve overall customer satisfaction and loyalty, but also helps airlines to stand out in the fierce market competition(Reichheld, F. F., & Schefter, P. 2002).

5.1.2 Identifying Service Shortcomings and Improvement Directions

The complaint hotspots and service shortcomings revealed in the study provide airlines with valuable opportunities for improvement. Through in-depth analysis of complaint data, airlines can pinpoint service shortcomings and problems and then formulate targeted improvement measures. This not only helps to improve service quality and customer satisfaction, but also helps airlines build a better brand image and enhance customer trust.

5.1.3 Improve Customer Loyalty and Reduce Churn Rate

In the airline industry, the improvement of customer loyalty is crucial to maintaining a stable customer base and reducing churn. By studying the influencing factors of customer loyalty, airlines can develop more effective customer maintenance strategies, such as offering points rewards and membership privileges, to incentivize customers to remain loyal. This will not only help to improve the profitability of the airline, but also create a more sustainable competitive advantage for the company in the market.

5.1.4. Promoting Innovation and Development in the Airline Industry

The results of airline CRM research not only contribute to the improvement and development of individual airlines, but also provide useful references and insights for the entire airline industry. By sharing and learning from the successful experiences and lessons of different airlines, the whole industry can jointly promote service innovation, process optimization and technological progress, so as to provide customers with a better and more efficient air travel experience.

In summary, the significance of the airline CRM research findings is that they provide airlines with important tools and ideas for optimizing customer experience, enhancing competitiveness, identifying service shortcomings, improving customer loyalty, as well as promoting industry innovation and development. These findings not only contribute to the success of individual airlines, but also have a positive impact on the future development of the entire airline industry.

5.2 Management Strategies and Recommendations

In-depth understanding of customer needs and preferences

1. Regular surveys: Regularly collect customers' feedback and opinions on airline services, flights, seats, catering, etc. through online questionnaires, telephone interviews or face-to-face interviews.
2. Customer segmentation: Based on the collected data, customers are segmented into different groups, such as frequent flyers, business travelers, family travelers, etc., and customized services are provided for each group.

Provide personalized services

1. Recommendation system: Based on customers' historical flight records, preferences and behaviors, recommend suitable flights, seats, meals, etc. for them.
2. Loyalty program: Set up a multi-level membership system to provide frequent flyers with privileges such as points accumulation, preferential discounts and priority seat selection.

Optimize resource allocation and operational efficiency

1. Predictive analytics: Utilize big data and AI technology to predict flight demand, seat allocation and employee workload to avoid wasted or insufficient resources.
2. Automated processes: Reduce manual operations and improve service efficiency and accuracy through automation technology.

Enhance risk management and response capabilities

1. Real-time monitoring: Use the CRM system to track and analyze customer data in real time to provide early warning of potential risks.
2. Contingency plans: Develop detailed contingency plans for different types of emergencies (e.g. weather changes, mechanical failures, etc.) to ensure customer safety and comfort.

Driving Business Innovation and Development

1. Data-driven decision-making: Utilizing the data in the CRM system to discover new market opportunities or potential customer groups, providing support for business innovation.
2. New Product Development: Develop new services or products, such as specialty flights and theme flights, based on customer needs and market trends.

Enhance brand influence and market competition

1. Quality service: Ensure employees are well-trained and able to provide enthusiastic, professional and efficient services.
2. Brand promotion: Promote the airline's brand image and service features through social media, advertisements, and partnerships.

By implementing the above strategies and recommendations, airlines can better manage customer relationships, improve customer satisfaction and loyalty, optimize resource allocation and operational efficiency, enhance risk management and response capabilities, promote business innovation and development, and thus enhance brand influence and market competitiveness.

5.3 Airline CRM trends

Regarding the future trend, airline CRM will show the following development directions:

1. Mobile: with the popularization of smart phones and the development of mobile Internet, mobile customer relationship management will become a new trend. Airlines can keep real-time interaction with customers through mobile APP, SMS service and other ways to provide more convenient and efficient services.

2. Intelligence: The application of artificial intelligence technology will further enhance the efficiency and accuracy of customer relationship management. Virtual assistants, machine learning algorithms and other technologies can help airlines quickly analyze large amounts of customer data, automate customer service, and provide personalized recommendations and suggestions (Bolander, W., Collopy, F., & Stark, E. 2017).

3. The growing importance of social media: Social media has become an integral part of customer relationship management. Airlines need to pay attention to customer feedback and needs on social media and respond to them in a timely manner. At the same time, the use of social media monitoring tools can help airlines understand customer behavior and opinions, and provide support for service improvement.

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Appendix I Questionnaire

Part 1: Basic information of customers

1. What is your gender?

- A.Man
- B. women
- C. unwilling to disclose

2. What's your age?

- A. Under the age of 18
- B.18-25 years old
- C.26-35 years old
- D.36-45 years old
- E.46-55 years old
- F.56 years old and above

3. What is your occupation?

- A.Students
- B.White-collar/office workers
- C.Freelancers/entrepreneurs
- D.Other (please specify)

4. What is your flight frequency?

- A.More than once a month
- B.once a quarter.
- C.Every six months.
- D.Once a year or less.

Part two: service quality evaluation (based on SERVQUAL model)

Please rate the following aspects on a scale of 1 (very dissatisfied) to 5 (very satisfied) according to your recent experience of flying with our airline:

1. The professionalism and friendliness of customer service personnel.
2. The convenience of boarding and baggage check-in.
3. Flight punctuality.
4. Aircraft comfort and cleanliness.
5. The quality and choice of catering and beverages.

Part 3: Customer loyalty evaluation (based on customer pyramid model)

6. How loyal are you to our airline?

- A. Very low
- B. Low
- C. general
- D. higher
- E. very high

7. Are you a frequent member of our airline?

-Yes.

-no

8. Would you like to recommend our airline to friends or colleagues?

-Yes.

-no

Part IV: Suggestions and Feedback

9. What do you think our airline needs to improve? [Open-ended questions]

10. What aspects of our airline are you satisfied with? [Open-ended questions]

Part V: Other information

11. What channel do you use most often to book flights?

A. Airline official website

B. Third-party booking websites (such as Ctrip and Qunar)

C. telephone reservation

D. on-site ticket purchase

E. others (please specify)

12. Would you like to participate in our airline's future market research activities?

-Yes.

-no