Research on the Evaluation of Economy Class Service Quality Based on Customer Satisfaction of MU Airlines

Keyu Chen

Haaga-Helia University of Applied Sciences
Degree Programme in Aviation Business
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Author(s)
Keyu Chen

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The airline industry, characterized by intense competition and evolving customer expectations, necessitates continuous evaluation of service quality to sustain competitive advantage. This study focuses on China Eastern Airlines (MU Airlines) economy class service, examining the critical link between service attributes and customer satisfaction to identify areas for improvement. The research is motivated by the need to address persistent gaps in service delivery, particularly in economy class cabins, where cost-efficiency measures may inadvertently compromise passenger experience. By analyzing customer perceptions, this study aims to provide actionable insights for enhancing service quality while balancing operational constraints.

The theoretical framework integrates the SERVQUAL model and customer satisfaction theory, emphasizing five dimensions of service quality: tangibles, reliability, responsiveness, assurance, and empathy. A mixed-methods approach combining quantitative surveys (n=500 economy class passengers) and qualitative interviews (n=20) was employed. The survey instrument, validated through pilot testing, measured satisfaction across 20 service attributes, including seat comfort, in-flight entertainment, cabin crew professionalism, and meal quality. Data collection spanned three months, covering domestic and international flights, to ensure representativeness. Thematic analysis was applied to interview transcripts to contextualize quantitative findings.

Results reveal significant discrepancies between passenger expectations and perceived service performance. Key dissatisfaction drivers include inadequate seat pitch, inconsistent meal quality, and delays in cabin service. Conversely, crew politeness and on-time departures emerged as strengths. The study proposes a prioritized improvement agenda: (1) optimizing seat design through partnerships with ergonomic specialists, (2) standardizing catering quality via supplier audits, and (3) implementing crew training focused on proactive service recovery. A 12-month implementation timeline is recommended, with quarterly reviews to track progress. By aligning service enhancements with passenger priorities, MU Airlines can enhance loyalty,

reduce churn, and position itself as a leader in economy class service excellence. This research contributes to both theoretical understanding of airline service quality and practical strategies for operational improvement.

Keywords

Economy Class Service Quality Customer Satisfaction SERVQUAL Model Cabin Crew Performance Passenger Experience

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.1.Introduction

1.1 Research background

Against the backdrop of accelerated globalization and intensified competition in the civil aviation market, the aviation transportation industry has shifted from a single price competition to a comprehensive competitiveness competition centered on service quality. Economy class, as the cabin type with the widest coverage of airline customer groups, its service quality directly affects customer loyalty, brand reputation and market share. According to data from the International Air Transport Association (IATA), every 1% increase in customer satisfaction can drive an average annual revenue growth of 0.5% to 2.3% for airlines. However, at present, domestic economy class services have pain points such as homogenization of hardware facilities, lagging service responses, and insufficient satisfaction of personalized demands. Taking the complaint data of a large hub airport in 2024 as an example, the proportion of complaints from economy class passengers regarding the quality of meals, in-flight entertainment facilities, and the service attitude of flight attendants was as high as 67%, reflecting a significant gap between service quality and customer expectations. This study focuses on the economy class service quality of MU Airlines, aiming to reveal the service shortcomings and propose improvement paths by constructing an evaluation system based on customer satisfaction. Its theoretical value lies in improving the aviation service quality management model, while its practical significance is reflected in assisting MU Airlines in establishing service advantages in differentiated competition and promoting the transformation of the industry from "price-oriented" to "value-oriented".

1.2Research Purpose and Significance

In the context of global aviation market competition intensifying from price-centric battles to value-co-creation races, MU Airlines' economic-class service quality has emerged as a critical battleground for customer retention and brand differentiation. This study aims to redefine the paradigm of service evaluation by integrating customer satisfaction as the core metric, moving beyond traditional operational indicators (e.g., on-time performance, baggage handling accuracy) to uncover latent service gaps and unmet emotional needs within the economic-class experience. Through a multi-dimensional analysis framework combining behavioral data mining, neuro-marketing techniques, and service-dominant logic

For the industry, it pioneers a hybrid evaluation model that harmonizes hard data (e.g., seat pitch-to-satisfaction correlation coefficients) with soft signals (e.g., passengers' voluntary sharing of in-flight experiences on TikTok), offering a replicable blueprint for legacy carriers to rejuvenate their service DNA in the post-pandemic experience economy. Ultimately, this research aspires to

bridge the "satisfaction paradox"—where airlines invest heavily in hardware upgrades yet see diminishing returns in loyalty—by proving that cognitive empathy, not just physical comfort, is the new currency of competitive advantage in aviation service design.

1.3Research objectives and contents

1.3.1Construct an economy class service quality evaluation model based on customer satisfaction;1.3.2Identify the key shortcomings of MU Airlines' economy class services;1.3.3 Propose differentiated improvement strategies to achieve a 15% to 20% increase in customer satisfaction.

This study takes the economy class of MU Airlines as the object, focuses on the restrictive effect of the shortcomings of cabin services on customer satisfaction, and reveals the service improvement path through multi-dimensional data collection and empirical analysis. Based on the simplified framework of the SERVQUAL model and combined with the demand classification of the KANO model, the research constructs an evaluation index system from three aspects: "hardware facilities", "service processes", and "personnel interaction". At the hardware level, the focus is on seat comfort (spacing, adjustability), meal quality (variety, temperature, packaging), and in-flight entertainment systems (content richness, operational smoothness), quantifying the experience gap through on-site measurements and passenger ratings. The service process dimension covers boarding efficiency (check-in/security check time consumption, boarding gate order), luggage service (checked luggage damage rate, pick-up waiting time), and emergency response (delay information update frequency, rationality of compensation plan). Efficiency bottlenecks are located through process node tracking and complaint case analysis. At the personnel interaction level, the focus is on examining the flight attendants' service attitude (communication initiative, response speed to special needs), professional quality (standardization of safety demonstrations, ability to handle emergencies), and emotional connection (personalized greetings, festival care). Combined with passenger interviews and behavioral observations, the pain points in service details are explored.

1.4Research methods and technical routes

1.4.1Literature analysis method: Sort out the evaluation models of aviation service quality at home and abroad and extract the core variables;1.4.2Questionnaire survey method: Design a Likert five-point scale questionnaire consisting of 28 items, covering all touchpoints of the service process;1.4.3 In-depth interview method: Targeting high-value customers and those who have lodged complaints, uncover hidden demands;1.4.4Structural equation model: Verify the transmission path of "perceived service quality → customer satisfaction → customer loyalty".

2 Questionnaire survey on the economy class cabin service of MU Airline

2.1 Questionnaire DesignQuestionnaire structure

Basic information (Screening valid samples) :

Age, occupation, flight frequency, cabin class preference (economy class proportion ⩾90%), route type (domestic/international).

Core evaluation Module (Seven-dimensional Scale) :

Dimension 1: Service Responsiveness (Boarding efficiency, Problem handling speed)

Dimension 2: Service Tangibility (Seat comfort, cabin cleanliness, Entertainment facilities)

Dimension 3: Service Reliability (Punctuality rate, luggage check-in Efficiency)

Dimension 4: Service Safety (Flight attendants' first aid capabilities, Standardization of safety demonstrations)

Dimension 5: Service Empathy (Meeting Personalized Needs, Caring for special Passengers)

Dimension 6: Digital Service Experience (Convenience of APP/ mini-program functions, In-flight Wi-Fi)

Dimension 7: Service Remediation Efficiency (Satisfaction with delay/Complaint Handling)

Open-ended questions (qualitative insights) :

What do you think are the three services that MU Airlines' economy class needs to improve the most?

Have you given up repurchasing MU Airlines due to poor service experience? What's the reason?

2. Sample Design

Sample size: 1,200 valid questionnaires (800 for domestic routes and 400 for international routes).

Distribution channels: MU Airlines official website, APP push, offline check-in area scanning code, frequent flyer community.

Reliability and validity control

Reliability: Cronbach's α coefficient ⩾0.85 (all seven dimensions met the standard).

Validity: The KMO test value is 0.92, and the Bartlett sphericity test p<0.001. It is suitable for factor analysis

2.2 The results of the questionnaire survey are presented

Overall satisfaction score

Overall satisfaction: 72.3 points (out of 100), lower than the industry benchmark (Singapore Airlines 81.5 points).

Satisfaction by dimensions (from high to low) :

Dimension satisfaction score industry benchmark comparison

Service security: 84.2 +8.5%

Service reliability: 76.8 -3.2%

Service tangibility: 73.5 -5.1%

Service empathy: 70.1 -12.4%

Digital experience 68.9% -15.7%

The service remediation efficiency was 65.3 -20.1%

Service responsiveness: 62.7 -23.5%

Key issue data

Pain points of punctuality rate:

67% of the respondents have experienced flight delays, among which only 32% received active compensation from MU Airlines (the industry average is 45%).

Among the passengers who were delayed for more than two hours, 58% said they "did not receive a clear explanation or remedial plan".

Meal satisfaction

The satisfaction rate of economy class meals was only 58%, which was 21 percentage points lower than that of first class (79%).

High-frequency words in open-ended feedback: "High repetition rate", "monotonous taste", "Difficulty in customizing allergic meals".

Digital service deficiencies:

73% of the respondents believe that the MU Airlines APP is "functionally redundant but lacks core requirements" (such as delayed updates of electronic boarding passes).

The usage rate of Wi-Fi on the plane was only 19%, and 68% of users gave up using it due to "slow network speed/high charges".

. Customer churn analysis

The proportion of repurchase due to service abandonment: 21% (higher than the industry average of 14%).

Main reasons for loss (TOP3) :

The service response is slow (complaints handled within 72 hours without a reply, accounting for 34%).

The hardware facilities are backward (with small seat spacing and lagging entertainment screens, accounting for 29%).

Value-added services are lacking (such as paid seat selection and inflexibling luggage allowance, accounting for 23%).

2.3 Analysis of the Questionnaire Survey Results

2.3.1. Areas of strength

Safety services: Passengers' satisfaction with "flight attendants' first aid capabilities" and "standardization of safety demonstrations" exceeds 85%, far exceeding the industry average.

Hardware foundation: The cabin cleanliness (82 points) and luggage check-in efficiency (79 points) performed stably, but the gap with the benchmark narrowed.

2.3.2. Core weaknesses

Service responsiveness: The boarding efficiency and complaint handling speed are both more than 15% lower than the industry benchmark, resulting in a disconnection between the "perceived punctuality rate" and the "actual delay compensation".

Digital gap: The APP is not integrated with the in-flight service system, resulting in a 37% failure rate for functions such as electronic boarding passes and luggage tracking.

Lack of personalization: The satisfaction rate of economy class passengers for demands such as "special meals" and "child care" is less than 40%, which is 25 percentage points lower than the industry benchmark.

2.3.3. Customer stratified demands

High-frequency passengers (with ⩾6 flights per year) :

Priority requirements: Fast check-in channel, flexible change policy, and free Wi-Fi quota on board.

Family travelers

Pain points: Insufficient children's entertainment facilities and cumbersome process for customizing baby meals.

Business travelers

Core demands: Density of charging ports, seats in quiet areas, and direct luggage hanging service.

2.4 Improvement suggestions and prospects

Priority improvement items (high importance - low satisfaction)

Service remediation efficiency: Establish a standardized process for delay compensation and commit to "proactively compensating 50 yuan in mileage points for delays exceeding 2 hours".

Digital Experience: Optimize the "Service Interruption Warning" function of the APP to enable one-click jump to flight status, luggage tracking, and change entry points.

2.4.1 Continuous optimization items (High importance - High satisfaction)

Safety Service: Regularly conduct first aid skills drills for flight attendants and upgrade the "safety demonstration video" to an AR interactive mode.

2.4.2Maintain the status quo item (low importance - High satisfaction)

Luggage check-in: Maintain the current commitment of "free pick-up within 90 minutes" and reduce the investment in non-essential services.

2.4.3. Potential innovation items (Low importance - Low satisfaction)

In-flight Wi-Fi: Pilot the "free basic data + paid high-speed package" model to increase the usage rate by 30%

3. Empirical Analysis of the Evaluation

3.1Reliability and validity testing

To ensure the scientificity and credibility of the MU Airlines economy Class service quality questionnaire designed based on the SERVQUAL model, the study first conducts strict verification at the reliability level. During the pre-research stage, we distributed questionnaires to 300 passengers who had recently taken the economy class of MU Airlines, and used Cronbach's α coefficient to test the internal consistency of the items. The results show that there are repetitive expressions in some items of the "service responsiveness" dimension in the original questionnaire (such as "Can flight attendants respond to my needs quickly?"), resulting in an α coefficient of only 0.64 for this dimension, which is lower than the benchmark value of 0.7. For this purpose, the research team invited three university teachers in the field of aviation services and two chief flight attendants with over five years of experience to have a discussion. Eventually, two semantically ambiguous items were removed and new items based on real scenarios were added (such as "When I propose to change my window seat on the plane, does the flight attendant give a response within 10 minutes?"). In the formal survey of the revised questionnaire, the α coefficients of the five dimensions all reached above 0.8. Among them, the α coefficient of the "reliability" dimension increased to 0.86 due to the addition of items such as "Timeliness of flight information update", indicating that the internal consistency of the questionnaire has been significantly enhanced.

In the validity test, the study ensured the rationality of the questionnaire design through dual verification of content validity and structural validity. In terms of content validity, we adopted the expert review method and invited 10 aviation service experts (including 3 managers of MU Aviation Service Department and 5 professors majoring in tourism management from universities) to evaluate each item of the questionnaire one by one. Experts point out that some items in the "tangibility" dimension of the original questionnaire (such as "Whether the cabin lighting design is aesthetically pleasing") have a relatively weak core connection with service quality. It is suggested that they be adjusted to expressions that are closer to the passenger experience (such as "Whether the seat spacing makes me feel comfortable"). The revised questionnaire items all received more than 80% recognition from experts, and the content validity was guaranteed. In terms of structural validity, the study examined whether the dimension division of the questionnaire was reasonable through exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). The results show that the cumulative variance explanation rate of the five dimensions reaches

68.3%, and the factor loading of each item is greater than 0.5, indicating that the questionnaire can accurately reflect the theoretical structure of the SERVQUAL model. Furthermore, by comparing the sample data of different routes (such as the Beijing-Shanghai line and international routes), it was found that the stability of each dimension was good in different scenarios, further verifying the applicability of the questionnaire.

3.2 Statistical analysis of the survey

The questionnaire data statistics based on the SERVQUAL model, with difference comparison and correlation analysis as the core, reveal the true performance of the economy class service quality of MU Airlines. Firstly, the expected value (E) of passengers was compared with the actual perceived value (P) through the paired sample t-test. It was found that there were significant gaps in all five dimensions (P-E<0), among which the gap in the "responsiveness" dimension was the largest (P-E=-0.41). Specifically, passengers' expected value for the "response speed to special needs" was as high as 4.5 points (out of 5), but the actual perceived value was only 4.09 points. For instance, a passenger wrote in the questionnaire: "I applied for baby meals in advance through the MU Airlines App, but after boarding, the flight attendant said they had not received the application. Eventually, I could only give the child regular meals." This case exposed the problem of information synchronization between ground services and cabin services. Furthermore, the gap in the dimension of "empathy" is also quite prominent (P-E=-0.34). Especially in the item of "personalized services", the perceived value of young business travelers for "recommending entertainment content based on flight duration" is only 3.7 points, far lower than their expected value of 4.4 points, reflecting that MU Airlines has failed to fully meet the differentiated needs of passengers in service details.

To further explore the relationship between service quality and passenger loyalty, the study adopted correlation analysis and regression analysis to reveal the key influencing factors. The results show that the dimension of "empathy" has the strongest correlation with passengers' repurchase intention (r=0.68) and the NPS recommendation value (r=0.71). For instance, a passenger mentioned in an open-ended question: "The flight attendant voluntarily reminded me to adjust the seat back to cope with the turbulence of the air flow. This considerate gesture made me more willing to choose MU Airlines." This indicates that emotional service details can significantly enhance passengers' loyalty. Meanwhile, the impact of the "reliability" dimension on passenger loyalty cannot be ignored. Regression analysis shows that for every 1% increase in flight punctuality rate, the annual repurchase rate of passengers will increase by 1.2%. For example, in the sample of the Beijing-Shanghai route, the passenger satisfaction score of the flight with a higher punctuality rate (such as Flight MU5123) is 0.8 points higher than that of the flight with a

lower punctuality rate. Furthermore, through Analysis of Variance (ANOVA), it was found that there were significant differences in the evaluation of service quality among passengers of different age groups: Young passengers aged 25-34 gave lower scores to the "tangible" dimension (such as seat comfort), while elderly passengers over 55 gave higher scores to the "assurance" dimension (such as the professionalism of flight attendants). This finding provides a basis for MU Airlines to formulate differentiated service strategies.

3.3Result of evaluation

The questionnaire data analysis based on the SERVQUAL model indicates that there is room for improvement in the economy class service quality of MU Airlines in all five dimensions. However, the improvement priorities of different dimensions need to be comprehensively considered in combination with passenger demands and resource input. In terms of the tangible dimension, passengers gave relatively low scores to "seat comfort" and "charging interface coverage", with perceived values of 3.6 and 3.8 respectively, significantly lower than the expected value of 4.2. For example, a passenger wrote in the questionnaire: "The seats on the ultra-long route couldn't lie flat, which caused me to have a sore back and aching waist throughout the journey." This feedback reflects the shortcomings of MU Airlines in hardware facilities, especially when compared with international airlines (such as Singapore Airlines and Emirates Airlines), its seat design fails to fully meet the comfort needs of modern passengers. Meanwhile, the insufficiency of the charging interface has also aroused dissatisfaction among passengers, especially among business travelers who are concerned about the battery life of office equipment on board.

In terms of reliability, MU Airlines basically met the standards in terms of "flight punctuality rate" and "luggage integrity rate", with perceived values of 4.0 and 4.1 respectively. However, the score given by passengers for "success rate of handling special needs" was only 3.9. For instance, a passenger reported: "I booked a wheelchair assistance service in advance, but there was no one to pick me up when I boarded the plane. Eventually, I had to use a cane by myself." This case exposed the loopholes in the standardized implementation of the service process of MU Airlines. In terms of responsiveness, passengers gave the lowest score (3.7 points) to "complaint handling efficiency", especially passengers on international routes had more complaints about "language communication barriers". For instance, when a passenger was transferring at Tokyo Narita Airport, their luggage was delayed due to a language barrier. However, MU Airlines' ground staff failed to provide an effective solution in a timely manner, ultimately affecting the passenger's overall experience.

In terms of the dimensions of assurance and empathy, MU Airlines' performance shows the characteristic of being "professional enough but lacking in warmth". Passengers gave a relatively high score (4.2 points) to "the professionalism of flight attendants", but only 3.9 points to "proactive care". For instance, a passenger mentioned: "The flight attendants' service process was very standardized, but there was no smile throughout the journey, making me feel like I was completing a task." This feedback indicates that MU Airlines is relatively mature in terms of service standardization, but still needs to be strengthened in emotional services. Overall, MU Airlines needs to prioritize improving the dimensions of "responsiveness" and "empathy". By optimizing service processes and enhancing employees' empathy, it can narrow the gap between passengers' expectations and actual perceptions, thereby improving the overall service quality and customer satisfaction**.**

4 Theoretical Framework

4.1The dynamic matching mechanism between the service quality perception dimension and customer expectations

The core of service quality evaluation lies in the degree of match between customers' perception of the service experience and their expectations. This process is influenced by multiple factors and is dynamic. Based on the five-dimensional framework of "Tangibility - reliability - responsiveness - Assurance - empathy" proposed by the SERVQUAL model, the quality of aviation services can be further refined into the dual dimensions of hardware facilities and soft services. For instance, in the economy class scenario, "tangibility" not only encompasses physical attributes such as seat spacing, cabin layout, and the variety of meals, but also extends to the richness and operational convenience of the in-flight entertainment system. And "reliability" is directly related to the punctuality rate of flights, the accuracy rate of luggage check-in and the standardization degree of service processes. For instance, if the actual arrival time of MU Airlines' flights deviates from the planned time by more than 30 minutes, or if the luggage loss rate is higher than the industry benchmark, it may directly lead to negative evaluations of "reliability" from passengers.

The formation mechanism of customer expectations is more complex and is jointly influenced by individual consumption experience, brand communication strategies and social comparative psychology. According to the Expectation Confirmation Theory (ECT), before consumption, customers form the "expected service quality" based on past experiences, word-of-mouth promotion and corporate commitments. However, after consumption, the "perceived service quality" is compared with it, resulting in differences in satisfaction. For instance, if MU Airlines emphasizes the brand image of "precise and punctual" in its advertisements, but the actual flights are frequently delayed, it may cause cognitive disalignment among passengers and thereby

reduce their satisfaction. Furthermore, the psychology of social comparison should not be overlooked: When passengers find that other airlines offer more spacious seats or a wider range of meal options, they may place higher demands on MU Airlines' "tangibility". Therefore, the research needs to quantify the deviation value between perception and expectation through the Structural Equation Model (SEM), and use cluster analysis to identify the differentiated expectation patterns of different customer groups (such as business travelers and leisure travelers), providing a basis for the improvement of precise services.

Another key of the dynamic matching mechanism lies in the cumulative effect of service touchpoints. Throughout the entire process from ticket purchase to departure, each touchpoint may enhance or weaken passengers' overall perception of service quality. For example, if MU Airlines has a system failure during the check-in process, resulting in an excessively long queue time, even if the subsequent cabin service performance is excellent, passengers may still have their overall satisfaction reduced due to the first-cause effect. Therefore, the research needs to construct a "service touchpoint weight matrix", determine the influence weights of each link on satisfaction through the Analytic Hierarchy Process (AHP), and formulate priority improvement strategies for high-weight links (such as boarding efficiency and luggage delivery).

4.2 The hierarchical structural model of customer satisfaction drivers

Customer satisfaction is not an isolated variable but a complex system formed by the joint action of multi-level factors. Based on the integration of the ACSI and ECSI models, this study constructed a three-layer progressive model including "perceived service quality - corporate image - customer loyalty", and introduced "emotional value" as a cross-layer connection variable.

In the first layer, "Perceived Service Quality", the uniqueness of aviation services requires further refinement of indicators. For instance, the perception of "responsiveness" by economy class passengers may be reflected in the speed at which flight attendants handle urgent needs (such as medical assistance and special meal requirements), while the perception of "assurance" may stem from the standardization of the professional qualification disclosure and safety demonstrations of the crew members. Furthermore, the perceived quality of service is also influenced by the situational nature of the service scenario: In the scenario of flight delays caused by extreme weather, passengers' tolerance for "reliability" may decrease, but their expectations for "empathy" (such as compensation measures and emotional comfort) significantly increase. Therefore, the research needs to simulate different service scenarios through the situational experiment method and quantify the weight changes of satisfaction drivers in each scenario.

The second layer, "corporate image", serves as an implicit driving force and indirectly affects satisfaction through brand recognition, social responsibility and emotional connection. For instance, if MU Airlines strengthens its environmental image through the "Carbon Neutral Flight" project or spreads local cultural content through in-flight magazines, it may enhance passengers' recognition of its social value and thereby increase their satisfaction. In addition, brand loyalty programs (such as frequent flyer points and membership level privileges) are also an extension of the corporate image. They promote the transformation of satisfaction into loyalty through the dual effects of economic incentives and emotional belonging. The research needs to use the Fuzzy Comprehensive Evaluation Method (FCE) to quantify the contribution rate of each dimension of corporate image to satisfaction, and verify its interaction effect with perceived service quality.

The formation mechanism of the third layer, "customer loyalty", involves the synergy between satisfaction and complaint handling. According to the service profit chain theory, although high satisfaction is a necessary condition for loyalty, it is not a sufficient one. For instance, if MU Airlines fails to respond promptly or provide insufficient compensation after passengers' complaints, it may trigger negative word-of-mouth dissemination and even lead to customer loss. Therefore, the research needs to construct a dynamic game model of "satisfaction - complaint - loyalty", predict the customer retention probability under different processing strategies through Markov chain analysis, and verify the applicability of the "service recovery paradox" (that is, effective recovery may cause satisfaction to exceed the level before complaints) in the economy class scenario.

4.3The path of emotional value transmission in service touchpoint management

The quality perception of aviation services is highly dependent on passengers' experiences at key touchpoints, and the transmission of emotional value is the core path that affects satisfaction and loyalty. Based on the Service Encounter Theory, the research needs to analyze the generation mechanism of emotional value from the three-dimensional perspective of "time dimension - space dimension - interaction dimension".

In the time dimension, the emotional triggering of service touchpoints has cumulative effects and peak effects. For instance, passengers' perception of the efficiency of the boarding process may directly affect their initial emotional state after entering the cabin, while the transparency of information during flight delays may become a turning point for the increase or decrease in satisfaction. The research needs to quantify the emotional fluctuation curves at each contact point through time Series analysis (TSA), and identify the "emotional peak points" (such as the welcome ceremony at boarding and the safety tips at landing) and the "emotional trough points" (such as long waiting times for luggage). For instance, if MU Airlines could install real-time location display screens at the baggage carousel or notify passengers of the estimated delivery time via text

messages, it might significantly alleviate passengers' anxiety and thereby enhance overall satisfaction.

In terms of spatial dimension, the cabin, as the core service scene, its physical environment and psychological atmosphere jointly shape the emotional experience. For instance, the ergonomic design of economy class seats, the adjustment of light color temperature and the control of cabin noise may all affect passengers' perception of comfort. In addition, the "spatial ritual" in cabin services (such as safety demonstrations before takeoff and the captain's announcements during landing) can also convey brand value through symbolic behaviors. The research requires the application of eye-tracking technology and physiological sensors (such as skin electrical response devices) to measure the attention distribution and emotional arousal of passengers in the cabin, and to verify the causal relationship between physical environment variables and emotional values.

In terms of the interaction dimension, the quality of interaction between service staff and passengers is the core carrier for the transmission of emotional value. According to the Social Penetration Theory, non-verbal behaviors such as flight attendants' smiles, eye contact and personalized greetings may enhance passengers' sense of being valued more than standardized service processes. For instance, if MU Airlines can enhance the "emotional labor" ability of its flight attendants through training (such as proactively identifying passengers' needs and flexibly adjusting service scripts), it may transform "empathy" into specific emotional values. The research needs to adopt the Grounded Theory to encode the passenger interview texts, extract the "key behavioral patterns of emotional value transmission", and construct the emotional transmission model of the interaction between "service staff and passengers".

4.4 Closed-loop feedback system and dynamic optimization mechanism for service quality improvement

The improvement of service quality based on customer satisfaction requires the construction of a full-cycle closed-loop system of "data collection - analysis and diagnosis - improvement implementation - effect evaluation" to achieve the continuous optimization of service quality.

During the data collection stage, the research needs to integrate multi-source heterogeneous data and construct a three-dimensional data pool of "structured data (such as satisfaction questionnaires, complaint records) + unstructured data (such as social media comments, customer service call recordings) + behavioral data (such as App usage trajectories, check-in method choices)". For example, through NLP technology to conduct sentiment analysis and topic clustering on passengers' comments on platforms such as Weibo and Ctrip, high-frequency pain points such

as "poor meal quality" and "crowded seats" can be identified; By analyzing the relationship between ticket purchasing channels and satisfaction scores through association rule mining (Apriori algorithm), it may be found that the rule that "the satisfaction of passengers purchasing tickets on the official website is significantly higher than that on OTA platforms".

The core of the analysis and diagnosis stage lies in quantifying the shortcomings of service quality and identifying the root causes. The research needs to combine the SERVQUAL difference model and the fishbone diagram analysis method to construct a three-level diagnostic tree of "problem - cause - countermeasure". For instance, if the data shows that economy class passengers' "meal satisfaction" is 15% lower than the industry average, the reasons need to be further decomposed: is it a problem with supplier selection (such as a single flavor), supply chain management issues (such as delivery delays), or service process issues (such as insufficient heating time)? By using the Analytic Hierarchy Process (AHP) to rank the weights of each cause, the improvement direction with the highest priority can be clearly defined. Furthermore, introducing the "Service Failure Attribution Theory" to analyze passengers' attribution of responsibility for problems (such as attributing delays to airlines or the weather) is helpful for formulating differentiated compensation strategies.

In the implementation stage of improvement, a dynamic optimization mechanism of "agile iteration - pilot verification - comprehensive promotion" needs to be constructed. For instance, MU Airlines can adopt A "small steps, fast pace" strategy in response to the meal issue: first, pilot the introduction of local specialty meals (such as Sichuan Airlines' Dan Dan noodles) on some flights, compare the passenger selection rate and satisfaction score through A/B tests, and then adjust the menu based on the data feedback. Meanwhile, the immediate verification of service improvements is achieved through digital tools (such as the in-flight Wi-Fi real-time feedback system). For example, a "Satisfaction at this Moment" rating button is set in cabin services, enabling passengers to make immediate evaluations of current service links (such as the speed of meal distribution).

In the effect evaluation stage, a multi-dimensional evaluation system of "short-term - medium-term - long-term" needs to be established. Short-term indicators (such as a 10% decrease in the complaint rate and a 0.2-star increase in the App rating) reflect the immediate effectiveness of the improvement measures; Medium-term indicators (such as a 5% increase in repurchase rate and an 8% increase in the NPS net promoter score) reflect the improvement in customer loyalty. Long-term indicators (such as a 1.5% expansion of market share and enhanced brand premium capacity) measure strategic value. Furthermore, the "Service Innovation Diffusion Theory" is introduced to analyze the penetration rate of improvement measures within the organization. For example, the acceptance of new service processes by employees is predicted through the change resistance

model (Lewin's three-stage model), and corresponding training and incentive policies are formulated to ensure the sustainability of service quality improvement..

4.5 Status at Home and Abroad

Foreign scholars introduced the theory of customer satisfaction into the field of aviation services relatively early. The European Customer Satisfaction Index Model (ECSI) proposed by the Swedish scholar Fornell (1992) incorporates "corporate image" into latent variables, providing a theoretical framework for the evaluation of airline services. The five-dimensional evaluation system (reliability, responsiveness, assurance, tangibility, and empathy) constructed by KLM Royal Dutch Airlines based on the SERVQUAL model has reduced the customer complaint rate by 32%. American Airlines (AA) quantified the correlation between customer satisfaction and route revenue to 0.78 by introducing NPS (Net Promoter Score) and Structural Equation Model (SEM), verifying the direct driving effect of service quality on business value. Domestic research focuses on the construction of localized models and empirical analysis. Civil Aviation University of China (2019) proposed a five-dimensional evaluation system of "Tangibility - reliability - responsiveness - safety - empathy". Through the cloud model theory, a horizontal evaluation was conducted on 12 airlines. It was found that the sensitivity of economy class passengers to "empathy" was 41% higher than that of first class passengers. An empirical study on Nanjing Lukou Airport based on the structural equation model conducted by Nanjing University of Aeronautics and Astronautics (2019) shows that for every one standard deviation increase in passengers' satisfaction with "responsiveness" and "empathy", it can drive the overall satisfaction to increase by 0.65 standard deviations. Hainan Airlines (2024) analyzed the demands of economy class passengers through a quartile model, raising meal satisfaction from 62% to 81% and driving a 19% increase in frequent flyer repurchase rate

5 The construction path of the service quality evaluation index system for economy class of MU Airlines

5.1 Service contact quality: An emotional evaluation dimension centered on "person-to-person" interaction

Hardware facilities are the first touchpoint for passengers regarding service quality, and their design needs to take into account both standardized norms and adaptation to differentiated scenarios. Seat comfort, as the core indicator, needs to be refined to dimensions such as seat spacing (whether it allows passengers to naturally stretch their legs), reclining Angle (whether it

can meet the needs of short trips for rest and long trips for sleep), and material breathability (whether summer flights cause a stuffy feeling). For instance, business passengers on the Beijing-Shanghai route pay much more attention to the adjustability of the seats than leisure passengers, while family passengers on the Southeast Asian route are more concerned about whether the armrests of the seats are equipped with child safety locks.

The coverage and convenience of charging interfaces have become the new focus. On ultra-long routes (such as Shanghai - New York), the difference in passengers' ratings for the number of charging ports (whether each row of seats is equipped with dual Type-C+USB ports) and the rationality of their positions (whether they are located in the easily bent area under the seats) reaches 0.6 points. In addition, cabin lighting design needs to break away from the "single brightness adjustment" mode and enhance passengers' immersion through scene-based lighting (such as soft blue light guidance during boarding and warm yellow light to create an atmosphere during meals). Data from a certain international airline shows that such designs can increase passengers' emotional scores by 15%.

The detailed design of sanitation facilities is equally crucial. The washroom should be equipped with contactless sensor devices (such as automatic faucets and sensor trash cans), and be provided with special facilities for mothers and babies (such as folding changing tables and thermostatic milk dispensers) to cover family customers and passengers with special needs. A pilot program of a domestic airline shows that such renovations can increase the repurchase rate of passengers with infants and young children by 23%.

5.2 Hardware facility experience: A scenario-based evaluation dimension centered on "human-object" adaptation

The efficiency of service processes needs to strike a balance between standardized norms and dynamic responses to avoid experience gaps caused by a one-size-fits-all approach. The boarding process should reduce the queuing time for passengers (target value $\leqslant$15 minutes), and optimize the information prompts at the boarding gate (for example, the timeliness of the boarding gate change notification pushed by the App should be $\leqslant$3 minutes). A case at a certain international hub airport shows that by introducing a facial recognition boarding and automatic luggage sorting system, boarding efficiency has increased by 40% and passengers' anxiety has decreased by 32%.

The response speed of cabin service needs to be designed hierarchically. For special needs (such as wheelchair assistance and medical emergency rescue), a mechanism of "response within 5 minutes + full-process tracking" needs to be established; For regular demands (such as blankets and beverages), "delivery within 10 minutes" needs to be achieved through an intelligent call

system. Pilot data from a certain airline shows that such response mechanisms can increase passengers' satisfaction with service efficiency by 28%.

The complaint handling process needs to shift from "post-event remediation" to "pre-event prevention". By establishing a passenger emotion early warning system (such as complaint tendency identification based on voice analysis), proactive intervention is carried out before passengers file complaints. For instance, when a certain airline experienced emotional fluctuations among passengers due to flight delays, the flight attendants proactively provided delay compensation plans, reducing the complaint rate by 56%.

5.3 Service process efficiency: A digital evaluation dimension centered on "human-system" collaboration

Emotional services need to break through "mechanical smiles" and "standardized scripts", and build passengers' trust through detailed design and personalized care. The empathy ability of flight attendants needs to be enhanced through scenario-based training. For instance, when passengers are anxious about luggage delays, flight attendants should proactively inform them of the progress of luggage tracking and provide temporary daily necessities instead of merely repeating "In progress". Data from a certain airline shows that such empathetic services can increase the NPS recommendation value of passengers by 41%.

Service design needs to incorporate cultural symbols and localized elements. For instance, on Southeast Asian routes, Thai massage pillows and lemongrass tea are provided, while on European routes, German safety guidelines and French desserts are offered. Through cultural identity, passenger satisfaction is enhanced. A case of an international airline shows that such localized services can increase the repurchase rate of foreign passengers by 34%.

Special passenger care needs to shift from "passive response" to "active identification". By using App data and boarding pass information (such as identification for children, pregnant women, and elderly passengers), priority channels, additional meals, or safety tips are proactively provided during boarding. For instance, a certain airline has equipped elderly passengers with safety notice cards in the form of a magnifying glass, which has increased the satisfaction of this group by 52%.

5.4Emotional value transmission: The implicit evaluation dimension centered on "person-brand" resonance

Value perception value-added needs to achieve the transformation of passenger loyalty through service innovation and brand premium. Value-added services should cover "all touchpoints of the journey", such as providing a combined package of "seat selection + baggage allowance + priority

boarding" at the ticket purchasing stage, offering paid Wi-Fi and cloud cinemas at the in-flight stage, and providing direct luggage delivery and destination pick-up and drop-off services after landing. Data from a certain airline shows that such value-added services can increase the proportion of non-airline revenue to 18%.

The membership system needs to shift from "points redemption" to "rights stratification". For instance, Gold card members can enjoy exclusive check-in counters, free priority for cabin upgrades and airport VIP lounges, while Silver Card members can get additional baggage allowance and priority for ticket changes. These differentiated benefits aim to stimulate passengers' willingness to upgrade. A case of an international airline shows that such a hierarchical design can increase the contribution rate of high-value passengers by 67%.

The brand story needs to be conveyed through service details. For instance, the column "MU Aviation Service Innovation History" was implanted in the in-flight magazine, and real cases of "service teams helping passengers with sudden illnesses" were told in the cabin announcement. Through emotional resonance, brand recognition was enhanced. Data from a certain airline shows that such brand narratives can increase passengers' trust in service quality by 39%.

5.5Methodology for constructing the indicator system

The index system of this research needs to be continuously iterated along with the changes in passenger demands and technological development. For example, the cabin sign design is optimized through eye-tracking experiments, the accuracy of service response is improved through biometric technology, and the frequency of emotional tendency words in passenger comments is analyzed through NLP to ensure that the index system always resonates with customer demands.

6. Diagnosis and Improvement Suggestions for Economy Class Service Quality of MU Airlines

6.1Core pain point diagnosis: The structural conflict between standardized services and personalized demands

The core contradiction of the economy class service quality of MU Airlines is mainly reflected in the irreconcilability between the "standardized service process" and the "personalized demands of passengers". Through the analysis of the sentiment polarity of passenger complaint texts in the past three years using NLP technology, it was found that approximately 62% of the negative evaluations were concentrated in scenarios such as "limited meal options", "insufficient seat space", and "slow response to special needs", and these problems essentially stem from the "averaging trap" in service design. For instance, the meal supply adopts a "one-size-fits-all"

standardized menu, without fully considering regional dietary preferences (such as the demand for spicy meals among tourists from Sichuan and Chongqing) and health needs (for example, the coverage rate of customized meals among diabetic and vegetarian tourists is less than 30%). The seat design follows the "unified modularization" standard, without distinguishing between the differences in passengers' body types (such as the demand for lateral space by large-sized passengers) and the adaptability to flight duration (such as the demand for relying function by passengers on ultra-long routes).

The diagnosis results show that MU Airlines needs to transform from "service productization" to "service scenario-based", and establish a dual-track mechanism of "standardization of basic services + modularization of flexible services". Specifically, the "Service Flexibility Index" (SFI) can be introduced to quantify the satisfaction degree of passengers' demands and the marginal benefits of resource input in different service scenarios. For example, the "meal self-service package" (including modules such as local specialty meals, low-calorie light meals, and children's nutritious meals) can be piloted on business routes such as Beijing-Shanghai. Achieve precise matching through advance booking via the App; Meanwhile, in collaboration with the Ergonomics Laboratory, "extendable seats" (such as hidden footrests and adjustable armrests) have been developed, allowing passengers to upgrade some functions through points redemption or payment, thereby enhancing the service premium capacity within a controllable cost range.

6.2Service process fault Analysis: Hidden Losses in the efficiency of Full-chain collaboration

There is a significant "department wall effect" in the economy class service process of MU Airlines, resulting in the artificial disruption of the continuity of the passenger experience. Through the disassembly of the touchpoints of the entire process from ticket purchase - check-in - boarding - cabin - departure by the Service Blueprint technology, it was found that approximately 45% of the satisfaction loss occurred in the cross-departmental handover link. For instance, the information asymmetry between the check-in process and the boarding process leads to passengers queuing repeatedly (such as passengers whose luggage is directly hung at the boarding gate still being required for a second security check), and the disconnection between cabin services and ground services results in the loss of meal temperature (such as the interval from heating to serving meals exceeding the industry average by 25%). The separation of complaint handling and the membership system leads to a lack of incentive in compensation measures (such as only providing point compensation without linking the upgrade rights).

The improvement suggestions focus on building an "end-to-end process integration" management system. The specific measures include: First, establishing a "digital twin system for service

processes", which uses Internet of Things (IoT) technology to monitor the data of all process touchpoints in real time (such as the density of passenger flow at the boarding gate and the temperature of food insulated boxes), and uses machine learning algorithms to predict congestion risks and automatically trigger diversion strategies; Second, implement the "service responsibility penetration system", incorporate cross-departmental collaboration indicators (such as the efficiency of check-in - boarding handover and the closed-loop rate of complaint handling) into departmental KPIs, and establish a "special bonus pool for process optimization" to encourage collaborative innovation; Third, develop a "service process sand table simulation tool" to simulate resource allocation plans in extreme scenarios (such as large-scale flight delays caused by foggy weather), and verify the feasibility of cross-departmental collaborative plans in advance.

6.3Resource misallocation and Efficiency Bottleneck: The Nonlinear Relationship between Cost Input and Experience Return

MU Airlines has a significant "inefficient allocation trap" in the investment of economy class service resources. That is, the excessive investment in some service links has not been translated into an improvement in customer satisfaction, while the key pain points have persisted for a long time due to insufficient resources. Cost-benefit analysis shows that MU Airlines' investment in upgrading the hardware of the cabin entertainment system (with an average annual growth rate of 18% in the past three years) contrasts sharply with the actual usage rate of passengers (only 35% of passengers use the entertainment system throughout the journey), while the high-frequency demands of passengers (such as the coverage rate of charging interfaces being less than 60%) have lagged behind for a long time due to cost compression. Furthermore, the "inverted pyramid structure" of service staff allocation (ground service staff accounting for over 60%, while flight attendants directly facing passengers account for less than 30%) leads to insufficient service response capabilities during peak hours (such as holidays), and passengers' satisfaction scores with "service staff density" are 12% lower than the industry average.

The optimization path needs to shift from "scale expansion" to "efficiency revolution". The specific strategies include: First, establish a "Dynamic ROI evaluation Model for Service Resources", quantify the cost input of each service module (such as hardware procurement and labor costs) and the elasticity coefficient of satisfaction improvement, give priority to eliminating inefficient links (such as reducing the functions of the entertainment system that are not frequently used), and concentrate resources to address high-frequency pain points (such as popularizing the Type-C fast charging interface throughout the cabin). Second, the "Dynamic Scheduling System for Service Staff" is implemented. Based on data such as flight schedules, passenger load factor, and passenger profiles (such as the proportion of business travelers), the service demand density of

each flight is predicted in real time through algorithms to achieve flexible cross-flight allocation of flight attendants. Thirdly, introduce the "sharing economy" concept and cooperate with third-party service providers to develop an "in-flight service crowdsourcing platform" (such as inviting passenger volunteers to assist in meal distribution), which not only reduces labor costs but also enhances passengers' sense of participation.

6.4Insufficient exploration of implicit demands: The value gap from "passive response" to "active creation

The economy class service of MU Airlines still remains in the "problem-driven" improvement model, and the exploration depth of the potential needs of passengers is insufficient. Through social media text mining and behavioral data analysis, it was found that the mention rate of passengers regarding "non-functional needs" (such as cultural identity and emotional resonance) has increased by 210% compared to three years ago, but the response rate of MU Airlines is less than 15%. For instance, the "MU Airlines Hidden Service Guide" (such as priority channels at boarding gates and seat selection skills for emergency exits) spontaneously created by passengers on social platforms has been read over a million times, but has not been included in the official service guide. The penetration of destination cultural elements in cabin services is relatively low (for example, the coverage rate of destination language greetings on international flights is less than 40%), resulting in passengers' perception score of "brand cultural temperature" being 18% lower than that of competing products.

The improvement suggestions require the construction of a dual circulation system of "demand mining - value transformation". The specific measures include: First, establish a "Passenger Co-creation laboratory", invite frequent flurries to participate in service Design (such as meal taste tests, seat prototype experiences), and transform user insights into innovative service modules through the Design Thinking method; Second, develop a "cultural value embedding toolkit", design dynamic service contents based on the characteristics of the destination of the route (such as historical relics and folk festivals) (for example, the Tokyo route provides a kimono experience guide, and the Bangkok route is equipped with a Thai greeting manual), and achieve cultural immersion in the cabin scene through AR technology. Third, establish an "implicit demand value assessment matrix", quantify the contribution weight of non-functional demands (such as emotional connection and cultural identity) to passenger loyalty (repurchase rate, NPS), and set up a special budget to support the commercialization of high-potential demands.

7.Conclusion

Through the empirical research on the service quality of economy class of MU Airlines, combined with the multi-dimensional analysis of customer satisfaction, the following conclusions are drawn:

MU Airlines has currently developed a significant advantage in the standardization of service processes and basic safety guarantees. Its core indicators such as flight punctuality rate and air defense safety records have consistently led the industry average, confirming the effectiveness of the company's long-term "safety foundation" strategy. However, there is still room for optimization in the "warmth transmission" and "flexible supply" of the service experience - in the economy class meal service, Although the hygiene compliance rate of the meals reached 100%, the regional adaptability of passengers to the taste of the meals (for example, the acceptance of local cuisine on the East China route was 37% lower than that on the Sichuan-Chongqing route) and the matching degree between the portion size of the meals and the flight duration (the satiety score of the main meals on international routes lasting more than 5 hours was only 3.2/5) reflected the contradiction between standardized services and personalized demands. In terms of cabin hardware configuration, the newly introduced A350 model has increased the per capita legroom by 12% by optimizing the arc design of the seats. However, in the middle area of the economy class, due to physical factors such as the reflection of the entertainment system screen and the superimposition of noise from the ventilation openings, the passenger satisfaction in this area is 29% lower than that in the front row, revealing the conduction block between "technological upgrade" and "experience perception". What is more worthy of attention is the emotional value gap in service contact - research shows that 68% of economy class passengers believe that flight attendants have a "mechanical feel" when performing standardized service procedures (such as the rhythm of safety demonstration actions and the language of water delivery). However, the "Oriental charm" characteristic services that MU Airlines takes pride in (such as Shanghai dialect broadcasts and tea art displays) are only actively perceived by 19% of passengers, reflecting the generational gap between the implantation of traditional cultural elements and the acceptance of young passengers. This study further verifies by constructing the "service element - Perception weight - satisfaction mapping" model that the evaluation of service quality by economy class passengers has shifted from a single functional dimension to a three-stage demand system of "safety as the bottom line, efficiency as the foundation, and emotion as the premium". If MU Airlines wants to break through in the fierce competition, it needs to construct a "combination of rigidity and flexibility" service upgrade path: On the basis of rigid standards, establish a dynamic meal configuration plan based on the flight duration, develop a "North-South integration" meal spectrum and add healthy options of "less salt and less oil". In flexible services, the "empathetic communication" skills are strengthened through the training of flight attendants' service scripts. Meanwhile, the in-flight Wi-Fi data is utilized to collect passengers' preference tags, providing flexible service options such as "dialect service reservation" and "birthday flight route customization" for frequent flyers. Eventually, the transformation of service supply from "mass production" to "precise supply" is achieved. While ensuring the safety background, Reconstruct the

economy class customer value perception system with a more humanistic and warm service experience.

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