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An Analysis of the Success Factors for Passenger Boarding Enthusiasm for Low-Cost Regional Airline Routes

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Abstract: Airports are important air transportation facilities, providing cargo transportation, aircraft takeoff and landing, and passenger services. Trade liberalization and globalization along with shifting economies and trading focuses have led to the rapid growth of airline and cargo transportation in Asia-Pacific regions. Therefore, Asian countries are constantly expanding and improving their airport facilities. Thus, improving and measuring airline service quality has attracted significant research attention in recent years. The Chinese Government has also actively promoted low-cost tourism, although competition in low-cost carrier markets was bound to be fierce. This not only promoted tourism industries but also attracted many foreign visitors to taking low-cost carriers to China for sightseeing. With international oil prices and regional economy issues, full-service carriers face considerable operational pressure on cost and competition. This study used the fuzzy delphi and decision making trial and evaluation laboratory methods to explore and analyze key factors for passengers choosing low-cost airlines. We considered passengers using U Airlines to travel from Shanghai to Taiwan (Taoyuan, Kaohsiung Far) and investigated service quality, low-price strategies, switching costs, and boarding willingness factors. We found that boarding willingness and service quality were strongly relevant to passenger satisfaction. Service quality should be prioritized, followed by switching cost, to enhance passenger boarding willingness. Low-cost regional airlines need to prioritize improving service quality empathy and service quality responsiveness with limited resources. Performance indicators such as willingness, service quality assurance, and service quality reliability showed significant benefits for overall service performance and passenger boarding willingness.

Keywords: service quality; switching cost; boarding willingness; fuzzy delphi method; decision making trial and evaluation laboratory method

1. Introduction

The first global low-cost carrier (LCC), Southwest Airlines, was established in the United States in 1978 with unprecedented low-cost, low-fare strategies to operate in the local civil aviation market. The innovation was widely favored by passengers and gradually expanded into a low-fare passenger airline market in the fiercely competitive civil aviation industry. Global passenger airline markets in Europe, Australia, and Southeast Asia subsequently started a new wave of low-cost carriers from 2000.

Southeast Asia currently has the most active low-cost carriers in Asia. Due to the price pressure from these LCCs, all additional costs other than transportation were reduced and directly reflected in low fares. Selling pure transportation became the commodity demand across the aviation industry during the sluggish period in the early 2000s and developed into a successful profit model. The new LCC market gradually crossed traditional regional markets, expanding northward to include China, Japan, and South Korea.

Air travel markets in China rapidly expanded in 2013, with almost a quarter of the population traveling by air each year. Airbus indicated that in the next 20 years, the number of people traveling by air in China would be equivalent to the Chinese total population, replacing the United States to become the largest global aviation market. The huge market potential would soon bring China into the LCC era to meet the needs of increasingly wealthy Chinese passengers.

The Chinese Government has also been actively promoting low-cost tourism. The Civil Aviation Administration planned to establish approximately 80 new airports by 2020 and advocated other airports to expand existing facilities with new terminals to provide LCC markets. This naturally engendered fierce market competition in the sector.

Low-cost carrier entry into the Chinese airline markets caused a significant impact on traditional airline market shares. The operating modes, fares, and service levels provided by the two airline types (full service carriers (FSCs) and LCCs) are very different. Domestic passengers were still unfamiliar with LCCs compared with traditional FSCs, and LCCs were quite controversial regarding service quality. When LCC competition was only promoted through price battles, consumers easily built a poor impression of inferior aircraft grades or services.

Most previous LCC studies considered behavioral intentions and prices rather than quality issues. Chinese passengers have a range of opinions regarding LCCs, but most expect good service quality regardless of cost. The main motivation for the present study was to investigate fundamental passenger preferences. How could passenger acceptance could be aligned with LCC operating policies and concepts? What gaps exist between passenger expectation and LCC operations? When passengers chose airlines, do they consider prices and service quality or simply choose traditional FSCs with superior services? This study considered LCC service quality to be the main effect, with the secondary effect being switching, to explain boarding (purchase) willingness. The study aims are described as follows.

1. To investigate potential problems for LCCs under regional multi-point route demands.
2. We derived three measure indicators from previous literature for service quality, switching cost, and boarding willingness for airline service quality to explore their interaction.
3. Expert questionnaires provided data to investigate key principles for passenger boarding willingness for regional LCCs. This also helped us to understand underlying reasons affecting passenger LCC choices.
4. The study conclusions provide suggestions and references for developing successful LCC routes.

The remainder of this paper is organized as follows. Section 2 reviews relevant literature, and Section 3 introduces the evaluation methodology employed. Section 4 verifies the proposed methodology with an example considering passenger boarding willingness for regional LCC airlines and explores success factors. Section 5 summarizes and concludes this paper and suggest some useful directions for future research.

2. Literature Review

2.1. Low-Cost Carriers

The International Air Transportation Association (IATA) indicated that the LCC definition is different from that of FCCs. LCCs reduce operating costs based on low-cost strategies. Following Berster and Wilken, larger airlines or networks, i.e., FCCs, showed more competitive advantages with business operation strategies emphasizing basic principles of simplicity and cost saving [1].

Low-cost carriers now operate globally, but LCCs operate differently in different regions. They are mainly focused on economic development, population structure, and other characteristics unique to each region. Barrett [2] showed that European LCC operating models and strategies included low airport take-off and landing costs, reduced air bridge usage, simpler terminal facilities, longer gates, convenient check-in procedures, and convenient passenger access. Operating concepts designed to reduce company expenses originated from Southwest Airlines, and Table 1 compares typical characteristics for LCC and FCC cases [3].

Table 1. Low-cost and full-service carrier characteristics.

Aspect	Item	Low-Cost Carriers (Spring Airlines)	Full-Service Carriers
Business type	Airline network	Point-to-point airline routes, mainly on direct flights	Radial network
	Model choices	Small and medium size, single model	Hybrid model
	Flight plan and strategic alliances	Not involved	Involved
	Employee salaries	Lower	Higher
	Number of air and ground employees	Fewer	More
	Target passengers	• Business passengers sensitive to prices • Tourism markets for sightseeing and leisure	• Commercial and first-class passengers served as profit sources • Economy class passengers served as the sources to cover cost
Service type	Numbers of flights	Fewer, e.g., two flights per week	Numerous flights every day
	Class configuration	Single class	Multiple classes
	Seat density	High, crowded	Low, relatively sparse
	Onboard meals	No free meals	Free meals provided
	Airport service	• Use secondary or tertiary airports • Low requirements on airport service	• Use a large hub airport • Provide services such as VIP rooms
Ticket service	Fare	• Single fare • Low fare plan	• Multi-level, multi-class fare pricing system • Large fare fluctuation ranges for the same flight
	Booking channels	Mainly direct, on-line, electronic ticket sales	• Rely on agents or travel agencies for booking • Call-centers
	Changes, refunds	Higher handling fees	Lower handling fees
	Check-in and boarding time	Automatic service, no check-in required, shorter time	Counter registration required, longer time
	Seat booking	Mon-reserved	Prior seat booking
	Free baggage	Light weight (10 kg), no towing baggage, discount available	Heavy weight, approximately 20 kg

Global LCC business models have matured, and interested parties have turned to investigating issues related to LCC aviation services. Scientific literature regarding LCC aviation includes passenger choice willingness [4–6], service characteristics [2,7,8], and the differences between traditional and low-cost aviation models [9].

2.2. Service Quality

Consumer spending power has grown enormously recently, and service content has become relatively emphasized by consumers [10]. Sustainable business management requires improved airline service quality [11]. The American Marketing Association (AMA) [12] defined service categories as "simple sales or offering satisfaction, benefits, and activities through product promotion". Buell [13] showed that services integrated multiple activities, satisfaction, and benefits provided by sales. Tatsuo Sugimoto [14] showed that service was a premise allowing companies to achieve business goals and

provide relevant activities to meet consumer needs and ensure relevant activity's interests. Garvin [15] indicated that good or bad service quality was a subjective consumer judgment rather than an objective evaluation. Parasuraman et al. [16] argued that cognitive service quality meant the result of comparing services expected by consumers with actual cognitive services. Sugimoto [17] showed that consumers were the only judges to evaluate service quality, and Goetsch and Davis [18] contended that quality not only referred to product quality but also included services, personnel, processes, and environment, at least for the service industries.

Service quality conceptualization and measurement has become a most controversial issue in the literature regarding service marketing [19]. Different industries should use different measurement methods to identify key factors to evaluate service quality [20]. When customers measure service quality, they tend to initially consider methods that provide service during the service process. Thus, the complexity of evaluating service quality is increased. Consequently, many studies have proposed service quality theory to measure the entire service quality. For example, Sasser et al. [21] contended that service quality should be measured by seven dimensions: security, consistency, attitude, completeness, condition, availability, and timing.

Lehtinen and Lehtinen [22] proposed three dimensions: service quality, physical quality, and interactive and corporate quality, which concentrate upon the company's image or evaluation. Parasuraman et al. [17] continued Grönroos' concept [23] to develop a set of service quality models, abbreviated as PZB. Various empirical studies showed that the 10 key quality elements overlapped. Parasuraman et al. [24] proposed 10 dimensions for common service quality parameters, which they modified into five dimensions and 22 questions, as follows.

Tangibles: physical equipment, devices, and manpower.

1. Reliability. Capability realized from dependable and correct implementation.
2. Responsiveness. Willingness to help customers and provide prompt service.
3. Assurance. Knowledge and diligence shown by employees, and their capability to win customer trust.
4. Empathy: providing customers with care and individual attention.

This scale allowed service quality to be more widely and practically used, and was an important milestone in service quality research.

Parasuraman et al. [25] partially modified the Service Quality (SERVQUAL) scale and added an importance measure to rank each dimension's importance. The original 22 questions' contents with negative sentences were changed into positive sentences. The modified scale's reliability and validity was superior to those of the original, and it was chosen as the modified SERVQUAL scale.

This modified SERVQUAL scale was subsequently used for most service quality research for practical applications [26], but some scholars argue different positions. Woodruff [27] and Carman [28] contended it was superfluous to measure service quality only through performance. Cronin and Taylor [29] also argued that measuring customer expectations was difficult and only service quality as perceived by customers should be used for evaluations.

In particular, the relationship Service quality (Q) = cognition (P) should first be established, and then the direct performance evaluation model used to measure the service performance (SERVPERF) scale for service quality. Subsequent studies indicated the SERVPERF scale offered superior predictive capability [29], but other studies used the SERVQUAL scale as a measurement basis and proposed a non-differential service quality measurement method (non-difference) to compare service quality with conformity between consumer expectation and cognition. The study found the non-difference scale was superior to SERVQUAL for reliability and validity [30]. However, Parsuraman et al. [31,32] contended that SERVQUAL measurement could provide ample diagnostic information. If management advice was required from surveys, then expected service should also be measured.

The SERVQUAL scale has been recently applied for aviation industry research. Gound and Kloppenborg [33] showed that airline supervisors, passengers, and federal government officials had significant differences in cognitive quality factors and that passenger satisfaction, in particular,

should be targeted to improve service quality. Ghobadin and Terry [34] proposed a quality function deployment model to measure passenger demand for service quality. They focused on technology, cost, and reliability using the quality planning concept to improve service quality. Park et al. [35] explored whether passengers' boarding willingness would be affected by airline service quality. They showed that passengers were affected by perceived service quality and passenger satisfaction. Differences in the company's image also affected decision making when choosing airlines. Chang et al. [36] showed that convenient flight departure and arrival times, fares, flight safety, membership programs, service quality, and crew languages were important factors affecting passenger airline choices. Similarly, Chang and Cheng [37] showed that fares, flight safety, service quality, and flights within a good time zone were the most important factors influencing passengers' airline choices.

The SERVQUAL scale has also been employed for banking [38], healthcare [39], and educational [40] service quality studies. The current study considered LCC service quality using the SERVQUAL scale [41] to construct airline service products to measure service quality.

3. Methodology

This study explored key factors of service quality, low-price strategies, and switching to identify passenger influences on LCC boarding willingness. Most previous studies did not consider cognition, attitude, and preference factors and hence failed to sufficiently develop accurate predictive models. However, several recent transportation industry studies abroad have included these factors and provided useful discussions.

Following those previous studies, we used fuzzy delphi method (FDM) and decision-making trial and evaluation laboratory (DEMATEL) approaches to solve problems, dividing the process into four stages to construct key principles for regional LCC boarding willingness.

1. We considered service quality based on domestic and foreign expert opinions.
2. We performed in-depth passenger interviews with experts, as well as expert questionnaires to better leverage expert experience and knowledge. The Delphi method was applied to expert feedback and opinions to objectively derive key factors for passenger regional LCC boarding willingness.
3. We conducted decision-making trial-and-evaluation laboratory method (DEMATEL) analyses to develop causality and relevance regarding the identified key factors for passenger regional LCC boarding willingness.
4. The research results were collated and reviewed for practical and specific reference for LCC operators. The final outcomes provide reliable key factors for passenger regional LCC boarding willingness.

3.1. Fuzzy Delphi Method

We used the FDM to objectively screen indicators for passenger regional LCC boarding willingness to establish a credible and representative evaluation framework. FDM double triangle fuzzy numbers were employed to integrate expert opinions, with gray zone verification to verify whether experts had reached consensus (convergence) [42,43]. Boarding willingness was then verified as below to ensure objectivity and practicality.

3.2. Decision Making Trial and Evaluation Laboratory Decision Method

We employed DEMATEL [42,43] to investigate LLC route causality and relevance to passenger boarding willingness.

Step 1. Define Elements and Evaluation Scales.

We used the FDM to objectively screen passenger LCC route boarding willingness in terms of causality and correlation between identified key LCC principles. The evaluation scale proposed by Fontela and Gabus [44] was used with design integrated decision making trial and evaluation laboratory based on analytic network process (DANP) and analytic network process (ANP) expert

questionnaires with four levels: 0 = no influence (0), 1 = slight influence, 2 = moderate influence, and 3 = considerable influence.

Step 2. Establish Average Expert Advice Matrices A

The quantity of the assessment items was set to n. The mutual impact scores for every assessment item determined by multiple experts (assessors) were compiled. Every expert questionnaire showed the $n \times n$ matrices of non-negative results. The scores of expert advice were summed and averaged to establish the average expert advice matrices A wherein A_{ij} meant the item xxx-false with its impact xxx-false. The diagonal in the matrices meant the self-impact degrees on every item. Because of no impact, the numeric of the diagonal was set to 0, as shown in Equation (1).

$$A = \begin{bmatrix} a_{11} & \dots & a_{1j} & \dots & a_{1n} \\ \vdots & & \vdots & & \vdots \\ a_{i1} & \dots & a_{ij} & \dots & a_{in} \\ \vdots & & \vdots & & \vdots \\ a_{n1} & \dots & a_{nj} & \dots & a_{nn} \end{bmatrix} \tag{1}$$

Step 3. Establish Normalized Average Matrix False Expert Advice D

The maximum of the total sum of both column vectors and row vectors in the average expert advice matrices A was set as normalized basis r. Then, every value in average expert advice matrices was, respectively, multiplied by $s = 1/r$. Namely, the equation $D = s \cdot A$ could obtain the normalized average expert advice matrices D wherein the matrix diagonal was set to 0, with the maximum of the total sum of both column vectors and row vectors equal to 1, as shown in Equations (2) and (3).

$$D = s \cdot A \tag{2}$$

$$s = \max\left[\frac{1}{\max\limits_{1 \le i \le n} \sum\limits_{j=1}^{n} \left|A_{ij}\right|}, \frac{1}{\max\limits_{1 \le j \le n} \sum\limits_{i=1}^{n} \left|A_{ij}\right|}\right] \tag{3}$$

Step 4. Establish Total Impact Relevance Matrices T

After average expert advice matrices D were obtained, because of $\lim\limits_{k \to \infty} D^k = 0$ (0 meant zero matrices), it was determined that $T = \frac{D}{I-D}$. "I" meant unit matrices with total impact relevance matrices T obtainable, as shown in Equation (4).

$$\begin{aligned} T &= \lim_{k \to \infty} (D + D^2 + D^3 + \ldots + D^k) \\ &= \tfrac{D}{I-D} \\ &= D(I-D)^{-1} \end{aligned} \tag{4}$$

Step 5. Define Threshold Values and Plot Causation Charts

The total average of the total impact relevance matrices T was regulated with threshold values α. If in the total impact relevance matrices T, when values were below α, they were replaced with 0. Otherwise, the values could remain available to remove the excessively weak impacted dimensions/indicators in the total impact relevance matrices T; the total impact relevance matrices could be obtained to plot the relevance in causation charts. Additionally, "$d + r$" and "$d - r$" were established by calculating the sum of every column and every row in total impact relevance matrices. In causation charts, "$d + r$" served as the horizontal axis and "$d - r$" served as the vertical axis. Helped

by causation charts, decision makers could perform suitable planning according to the mutual impact on dimensions/indicators, together with the resultant category or the affected category. In the total impact relevance matrices xxx-false, the equation to sum every column and every row is described in Equations (5) and (6) as follows (Fontela and Gabus [41]):

$$d = (d_i)_{n\times 1} = [\sum_{j=1}^{n} t_{ij}]_{n\times 1} \tag{5}$$

$$r = (r_j)_{n\times 1} = (r_j)'_{1\times n} = [\sum_{i=1}^{n} t_{ij}]'_{1\times n} \tag{6}$$

4. Results and Discussion

This study investigated the key factors for passenger attitudes toward regional LCC routes. Table 2 shows key factors from indicated previous studies [45,46], to establish a credible and representative evaluation project actually visiting the passengers at the Shanghai Pudong Airport from the Spring Airlines flights to the Kaohsiung Airport in Taiwan and conducting a study with expert questionnaires.

4.1. Fuzzy Delphi Method Key Factors for Passenger Attitudes toward Regional Low-Cost Carrier Routes

We considered previous literature regarding service quality, switching cost, and boarding willingness to define 3 major dimensions, 7 measurement indicators, and 29 evaluation factors. We then applied the FDM and DEMATEL with gray zone verification to examine and integrate expert opinions [42,43]. This objectively screened key factors for passenger attitudes toward regional LCC routes. The analysis is described in the subsequent sections.

4.1.1. Design of a Fuzzy Delphi Non-Expert Questionnaire for Key Factors for Passenger Attitudes toward Regional Low-Cost Carrier Routes

A panel of experts were requested to:

1. Provide suitable decisions for each evaluation item;
2. Designate conservative, best, and optimistic values for each evaluation item, where the evaluation comprised grades 1–10 with higher scores for higher importance;
3. Add, modify, or merge evaluation items with their importance scores evaluated.

4.1.2. Pre-Test Analysis for Key Factors

Fuzzy delphi expert questionnaires were employed to obtain expert consensus regarding key factors for passenger attitudes toward regional LCC routes. We applied a pre-test for the questionnaire including 10 passengers from Shanghai Pudong Airport to Kaohsiung using Spring and Juneyao airlines. The outcomes from the pre-test were as follows.

1. The pre-test expert background analysis for the key principles of passengers' attitudes toward low-cost regional airline routes.

Table 2. Identified key factors for passenger attitudes regarding low-cost regional airline routes.

Latent Variables	Variable Dimension	Operational Definition	Measurement Item	Literature Source
Service quality	Tangibility (tangible)	Considering facilities, equipment, employees, and external communication information. The status of surrounding entities was explicit proof for the concern from customers. This dimension included parts established by customers when service was provided.	1. Modernization of cabin equipment. 2. Clean and comfortable cabins and seats. 3. Suitable temperature and ventilation in cabins. 4. Neatly dressed and friendly service staff. 5. Airline customer service websites provided sufficient information.	Parasuraman et al. (1991)
	Reliability	Offered services were performed reliably and correctly, and reliable service performance was the one expected by customers. Service work was completed punctually and consistently without errors.	6. Airline websites provided multiple languages for booking inquiries, and services were safe and confidential. 7. Airline one-stop smart facility service (check-in and boarding) waiting time within acceptable range. 8. Onboard flight attendant services met passenger needs 9. High flight punctuality and trustworthiness. 10. Airline baggage delivery service was specified as clearly available for checking.	
	Responsiveness	Provide immediate service and assist customers to avoid negative outcomes due to long waits. When service failed, professionalism was strictly kept to quickly restore services forming the positive cognitive impression of quality.	11. When flights were delayed, changed, or canceled, airlines took the initiative to notify passengers. 12. When passengers had problems and lodged complaints, airlines dealt with them quickly. 13. When passengers put forward suggestions, airlines valued and accepted them. 14. Airlines had a positive attitude toward unexpected situations.	
	Assurance	Knowledge, courtesy, and capability to convey trust and confidence among service staff. This included providing appropriate services, courtesy and respect for customers, effective customer communication channels, and caring for customer interests.	15. Airlines emphasized the image of flight safety. 16. Airlines emphasized passenger rights and interests.	
	Empathy	Providing customers with personalized care, including amiable attitudes.	17. Airlines provided pre-flight service items to meet passenger needs. 18. Airlines provided options for self-pay insurance against delayed or canceled flights. 19. Airlines provided self-paid meals, and the meals were changed regularly. 20. Airline flight attendants would actively help special passengers (such as elderly passengers, pregnant women, infants, blind passengers, etc.). 21. Airlines continued engaging in service innovation and improvement.	
Switching cost	Loss cost	When consumers switched service providers, they had to give up the cost of the original airline service.	22. The switching behaviors of passengers who could not use the VIP rooms of original airlines for free.	Kim et al. (2004)
	Adaptation cost	After switching to another service provider, consumers had to adapt to different services and relationships.	23. Passengers could no longer continue using discounts or favors from original airlines. 24. No compensation for passengers whose flights were delayed or canceled. 25. Baggage restrictions: additional fees charged for overweight baggage.	
Boarding willingness	Purchase consideration	Consumers considered buying products.	26. Would passengers switch to another airline with lower fares? 27. Passengers were satisfied with services from their current low-cost carrier.	Sirohi, Mclaughlin, and Wittink (1998)
	Purchase willingness	Consumers willing to buy products	28. Passengers were willing to choose this low-cost carrier next time	
	Recommended to others	Consumers recommend others to buy products	29. Passenger would recommend others to use this low-cost carrier.	

The key factors for passenger attitudes were verified by the FDM. It meant using surveyed passengers taking low-cost regional airline routes as sampling matrices to conduct questionnaire surveys and data analysis. Questionnaires were distributed at each airport station (the Shanghai Pudong T2 terminal lounge), with 10 passengers participating. All 10 questionnaires were valid and suitable for inclusion in the subsequent analysis.

2. The pre-test analysis of measurement indicators for the key principles of passengers' attitudes toward low-cost regional airline routes.

Double triangle fuzzy numbers were integrated with expert opinions [42,43], and we employed gray zone tests to check for convergence. We used Microsoft Excel for the pre-test analysis, following Ishikawa et al. [45]. Klir and Folger [46] showed that the threshold could be reduced when decision makers found too few measurement indicators and increased otherwise. Expert consensus thresholds for screening passenger attitudes toward regional LCC routes were derived following Zhengzhong [44] and employing the 80/20 rule. Thus, an expert consensus average Gi = 7.213 was multiplied by 0.8 to obtain threshold = 5.770, and lower expert responses were deleted. A total of eight measurement indicators were retained. Table 3 shows the final results.

This study also used broken-line charts to analyze the expert consensus. Expert values above the threshold implied consistency and importance and hence the considered variate was a key factor. Screened results included the variables shown in Table 1 (column 2), and all the thresholds were reachable and retained.

4.1.3. Pre-Test Evaluation for Key Factors

This study screened assessable factors to avoid extremes. Twenty-nine evaluation factors were analyzed using Microsoft Excel. Applying the 80/20 ratio, overall average expert consensus = 6.102, and, hence, threshold = 4.882. One factor was below the threshold and so the remaining 29 evaluation factors were retained, as shown in Table 4.

4.1.4. Measurement Indicators for Key Factors for Passenger Boarding Willingness

We analyzed the FDM expert questionnaires [42,43] following the operational steps proposed by Ishikawa et al. [47], using Microsoft Excel. Expert opinions were converted into double triangular fuzzy numbers for convergence, establishing expert consensus at 5842, with lower scores being deleted. All seven measurement indicators for key factors for passenger boarding willingness exceeded the consensus threshold, and hence, all were retained.

Taking the resulting measurement indicator scores, with overall average = 7.283, and after applying the 80/20, we established expert consensus threshold = 5.823. All seven identified measurement indicators (service quality tangibility, reliability, responsiveness, assurance, and empathy; switching cost; and boarding willingness) achieved the consensus threshold, and hence, all were retained.

4.1.5. Evaluating Key Factors for Passenger Boarding Willingness

This research is broken down into pre-test and post-test. Pre-test, a total of 10 executive experts (managers, etc. from the fields) performed the assessment. In the post-test survey, a total of 52 experts participated in the survey. These 52 experts include the 10 executive experts, and 42 of them were experts in airport operations. We used Microsoft Excel to screen potential factors and avoid extreme outcomes. Overall average expert consensus = 6.862, and yielding threshold = 5.461. Table 5 shows that all 29 evaluation factors achieved the threshold and hence were retained.

Table 3. Key factors from the pre-test for passenger boarding willingness for regional low-cost carrier routes.

Dimension	Measure Indicator	Conservative Value Ci		Optimum Value ai		Optimistic Value Oi		Geometric Mean M			Mi	Zi	Verification value MI-Zi	Expert Consensus Value GI
		Min	Max	Min	Max	Min	Max	Ci	ai	Oi				
Service quality	Tangibility	3	8	5	9	7	10	5.92	7.18	9.08	3.166	1	2.166	7.500
	Reliability	1	8	3	9	5	10	5.13	6.89	8.64	3.507	3	0.507	6.679
	Responsiveness	2	8	3	9	6	10	5.05	6.13	7.91	2.875	2	0.857	6.786
	Assurance	4	7	5	8	6	10	5.77	7.04	8.46	2.698	1	1.698	6.666
	Empathy	3	7	6	8	8	10	5.93	7.68	9.40	3.464	−1	4.464	7.432
Switching cost		3	8	6	9	8	10	5.65	7.56	9.09	3.436	0	3.436	8
Boarding willingness		3	8	5	9	6	10	6.01	7.41	8.87	2.863	2	0.863	7.180
Index selection Total				7					Threshold value					5.770

Table 4. Key factors for passenger boarding willingness for regional low-cost carrier routes.

Evaluation Item			Conservative Value Ci		Optimum Value ai		Optimistic Value Oi		Geometric Mean M			Mi	Zi	Verification Value Mi-Zi	Expert Consensus Value Gi
Measure Principle		Evaluation Factor	Min	Max	Min	Max	Min	Max	Ci	ai	Oi				
Service quality Tangibility	1.	Modernization of cabin equipment.	4	8	8	9	9	10	6.843	8.557	9.703	2.861	−1	3.861	8.622
	2.	Clean and comfortable cabins and seats.	4	8	7	9	9	10	6.713	8.117	9.416	2.702	−1	3.702	8.756
	3.	Suitable temperature and ventilation in cabins.	4	8	7	9	8	10	6.694	8.099	9.259	2.656	0	3.702	8.756
	4.	Neatly dressed and friendly service staff.	3	8	6	9	7	10	6.007	7.643	8.799	2.792	1	1.792	7.474
	5.	Airline customer service websites providing sufficient convenience information.	3	8	4	9	5	10	6.123	7.477	8.642	2.519	3	−0.481	6.980
Service quality Reliability	6.	Airline websites provided multiple languages helpful for booking inquiries, and services were safe and confidential.	3	8	7	9	9	10	6.443	8.117	9.275	2.832	−1	3.832	8.850
	7.	Airline one-stop smart facility service (check-in and boarding) waiting time within the acceptable range.	3	8	7	9	9	10	6.567	8.255	9.416	2.848	−1	3.848	8.775
	8.	Airline flight attendant services on board meeting passenger needs.	4	8	7	9	9	10	6.843	8.255	9.416	2.573	−1	3.573	8.736
	9.	Airline flights showed high punctuality rates, and they were trustworthy.	5	8	6	9	8	10	6.481	7.791	9.120	2.639	0	2.639	8.000
	10.	Airline baggage delivery service was specified as clearly available for checking.	1	7	3	9	5	10	4.283	6.365	7.914	3.630	2	1.630	6.035

Table 4. *Cont.*

Evaluation Item			Conservative Value Ci		Optimum Value ai		Optimistic Value Oi		Geometric Mean M			Mi	Zi	Verification Value Mi-Zi	Expert Consensus Value Gi
Measure Principle		**Evaluation Factor**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Ci**	**ai**	**Oi**				
Responsiveness of service quality	11.	When flights were delayed, changed, or canceled, airlines would take the initiative to notify passengers.	1	8	3	9	5	10	4.939	6.839	8.479	3.540	3	0.540	6.596
	12.	When passengers had problems and lodged complaints, airlines would deal with them quickly.	5	8	6	9	7	10	6.042	7.516	8.667	2.625	1	1.625	7.460
	13.	When passengers put forward suggestions, airlines could value and accept them.	4	8	6	9	7	10	6.335	7.905	9.221	2.886	1	1.886	7.572
	14.	When flights were delayed, changed, or canceled, airlines would take the initiative to notify passengers.	4	8	7	9	9	10	6.398	7.964	9.275	2.877	−1	3.877	8.833
	15.	Airlines had a positive attitude toward unexpected situations.	3	8	4	9	5	10	5.597	7.716	8.352	2.755	3	−0.245	6.747
Assurance of service quality	16.	Airlines emphasized the image of flight safety.	1	8	2	9	3	10	4.549	6.533	7.796	3.246	5	−1.754	5.908
	17.	Airlines emphasized the rights and interests of passengers.	1	8	2	9	3	10	4.650	6.410	7.666	3.015	5	−1.985	5.910
Empathy of service quality	18.	Airlines provided pre-flight service items to meet passenger needs.	3	8	4	9	5	10	5.491	7.176	8.513	3.022	3	0.022	6.750
	19.	Airlines provided options for self-pay insurance compensation against delayed or canceled flights.	3	7	4	8	5	9	5.656	6.843	8.137	2.481	2	0.481	6.400
	20.	Airlines provided self-paying meals, and these meals would be changed regularly.	4	7	6	8	7	9	5.441	7.093	8.395	2.955	0	2.955	7.000
	21.	Airline flight attendants would actively help special passengers (such as elderly passengers, pregnant women, infants, blind passengers, etc.).	6	8	7	9	8	10	6.827	7.831	9.120	2.293	0	2.293	8.000
	22.	Airlines continued engaging in service innovation and improvement.	4	8	6	9	7	10	6.123	7.336	8.652	2.529	1	1.529	7.468
Switching cost	23.	The switching behaviors of passengers who could not use the VIP rooms of original airlines for free.	0	7	0	9	0	10	0.000	0.000	0.000	0.000	7	−7.000	0.0000
	24.	The switching behaviors of passengers who could no longer continue using the discount or favors of original airlines.	4	8	6	9	7	10	5.907	7.477	8.632	2.726	1	1.726	7.438
	25.	There was no compensation for passengers whose flights were delayed or canceled.	4	8	6	9	7	10	5.965	7.477	8.799	2.833	1	1.833	7.469
	26.	Passengers faced baggage restrictions; if baggage was overweight, additional fees should be charged.	1	7	2	8	3	9	4.494	6.198	7.438	2.944	4	−1.056	5.557
Boarding willingness	27.	Due to price factors, you would switch to another airline with lower fares.	3	8	7	9	9	10	6.141	7.964	9.275	3.314	−1	4.134	8.871
	28.	You were satisfied with the services of the current low-cost carrier.	3	8	4	9	5	10	5.359	6.959	8.123	2.763	3	−0.237	6.625
	29.	If necessary, you were willing to choose this low-cost carrier next time	1	7	2	8	3	10	4.494	6.317	7.551	3.057	4	−0.343	5.580
	30.	I would recommend others to use a low-cost carrier.	1	8	2	9	3	10	4.650	6.284	7.666	3.015	5	−1.985	5910

Table 5. The key principles for the boarding willingness of passengers toward low-cost regional airline routes (the post-test analysis screening table for measurement indicators).

Evaluation Item			Conservative Value Ci		Optimum Value ai		Optimistic Value Oi		Geometric Mean M			Mi	Zi	Verification Value Mi-Zi	Expert Consensus value Gi
Measure Principle		**Evaluation Factor**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Ci**	**ai**	**Oi**				
Service quality Tangibility	1.	Modernization of cabin equipment.	3	8	5	9	6	10	6.191	7.695	9.004	2.813	2	0.813	7.248
	2.	Clean and comfortable cabins and seats.	4	8	5	9	6	10	6.474	7.938	9.299	2.826	2	0.826	7.367
	3.	Suitable temperature and ventilation in cabins.	4	8	6	9	7	10	6.536	8.024	9.392	2.856	1	1.856	7.620
	4.	Neatly dressed and friendly service staff.	3	8	6	9	7	10	6.253	7.724	9.127	2.874	1	1.874	7.549
	5.	Airline customer service websites providing sufficient convenience information.	3	8	4	9	5	10	6.406	7.917	9.343	2.937	3	−0.063	7.195
Service quality Reliability	6.	Airline websites provided multiple languages helpful for booking inquiries, and services were safe and confidential.	3	8	6	9	7	10	6.157	7.918	9.318	3.161	1	2.161	7.557
	7.	Airline one-stop smart facility service (check-in and boarding) waiting time within the acceptable range.	3	8	6	9	7	10	6.210	7.783	9.134	2.924	1	1.924	7.544
	8.	Airline flight attendant services on board meeting passenger needs.	3	8	5	9	6	10	6.310	7.817	9.162	2.851	2	0.851	7.303
	9.	Airline flights showed high punctuality rates, and they were trustworthy.	2	8	4	9	6	10	5.860	7.547	9.016	3.152	2	1.152	7.170
	10.	Airline baggage delivery service was specified as clearly available for checking.	1	8	3	9	4	10	5.051	6.748	8.247	3.196	4	−0.804	6.361
Responsiveness of service quality	11.	When flights were delayed, changed, or canceled, airlines would take the initiative to notify passengers.	1	8	3	9	5	10	5.772	7.387	8.742	2.970	3	−0.030	6.880
	12.	When passengers had problems and lodged complaints, airlines would deal with them quickly.	2	8	4	9	6	10	6.280	7.812	9.190	2.910	2	0.910	7.299
	13.	When passengers put forward suggestions, airlines could value and accept them.	2	8	3	9	4	10	5.870	7.347	8.891	3.020	4	−0.980	6.787
	14.	When flights were delayed, changed, or canceled, airlines would take the initiative to notify passengers.	1	8	3	9	4	10	5.887	7.496	8.934	3.046	4	−0.954	6.801
	15.	Airlines had a positive attitude toward unexpected situations.	2	8	3	9	4	10	5.509	7.102	8.527	3.018	4	−0.982	6.580

Table 5. *Cont.*

Evaluation Item			Conservative Value Ci		Optimum Value ai		Optimistic Value Oi		Geometric Mean M			Mi	Zi	Verification Value Mi-Zi	Expert Consensus value Gi
Measure Principle		**Evaluation Factor**	**Min**	**Max**	**Min**	**Max**	**Min**	**Max**	**Ci**	**ai**	**Oi**				
Assurance of service quality	16.	Airlines emphasized the image of flight safety.	1	8	2	9	3	10	5.472	7.170	8.594	3.122	5	−1.878	6.444
	17.	Airlines emphasized the rights and interests of passengers.	1	8	2	9	3	10	5.452	7.088	8.607	3.155	5	−1.845	6.438
Empathy of service quality	18.	Airlines provided pre-flight service items to meet passenger needs.	2	8	4	9	5	10	5.719	7.306	8.830	3.111	3	0.111	6.880
	19.	Airlines provided options for self-pay insurance compensation against delayed or canceled flights.	2	8	4	9	5	10	5.65-	7.219	8.603	2.953	3	−0.047	6.816
	20.	Airlines provided self-paying meals, and these meals would be changed regularly.	2	8	3	9	4	10	5.055	6.715	8.085	3.030	4	−0.970	6.324
	21.	Airline flight attendants would actively help special passengers (such as elderly passengers, pregnant women, infants, blind passengers, etc.).	3	8	4	9	5	10	5.634	7.084	8.519	2.885	3	−0.115	6.794
	22.	Airlines continued engaging in service innovation and improvement.	2	8	5	9	6	10	5.613	7.270	8.545	2.932	2	0.932	7.032
Switching cost	23.	The switching behaviors of passengers who could no longer continue using the discount or favors of original airlines.	2	8	3	9	4	10	5.954	7.473	8.909	2.956	4	−1.044	6.823
	24.	There was no compensation for passengers whose flights were delayed or canceled.	2	8	4	9	5	10	6.146	7.665	8.925	2.778	3	−0.222	7.038
	25.	Passengers faced baggage restrictions; if baggage was overweight, additional fees should be charged.	1	8	2	9	3	10	5.159	6.924	8.392	3.233	5	−1.767	6.274
Boarding willingness	26.	Due to price factors, you would switch to another airline with lower fares.	3	8	5	9	6	10	6.174	7.706	9.125	2.952	2	0.952	7.359
	27.	You were satisfied with the services of the current low-cost carrier.	2	8	4	9	5	10	5.875	7.410	8.918	3.043	3	0.043	6.945
	28.	If necessary, you were willing to choose this low-cost carrier next time	1	5	2	9	3	10	5.625	7.124	8.581	2.955	5	−2.045	6.508
	29.	I would recommend others to use a low-cost carrier.	1	8	2	9	3	10	5.805	7.369	8.814	3.009	5	−1.991	6.630

4.2. Analyzing Causality and Correlation

We recruited 52 experts to complete the DANP questionnaires and employed DEMATEL to explore causality and relevance for the identified key factors for passenger boarding willingness.

4.2.1. Questionnaire Design

We used DANP as the operating reference to construct the expert questionnaires around the identified three major dimensions and seven indicators, combining DEMATEL causality and relevance analysis with ANP to explore relative weighting and importance ranking for the key factors.

4.2.2. Questionnaire Analysis

The DEMATEL steps employed to analyze causality and relevance were as follows.

Step 1. Define elements and evaluation scales.

We followed the four-level DANP evaluation scales proposed by Fontela and Gabus [44], where 0 = no influence, 1 = slight influence, 2 = moderate influence, and 3 = considerable influence.

Step 2. Establish the average expert advice matrix

We converted the questionnaire results into matrix form, and experts assessed the degree of mutual influence between dimension pairs. MS EXCEL was then employed following (1) to calculate the arithmetic average for each question. Tables 6 and 7 show the resulting average expert advice matrix, A, and subsequent average expert advice indicators matrix.

Table 6. Expert advice matrix for the identified key factors for passenger boarding willingness for regional low-cost carrier routes.

The Average Expert Advice Matrix of Dimensions	Service Quality	Switching Cost	Boarding Willingness
Service quality	0.000	1.942	2.404
Switching cost	1.904	0.000	2.058
Boarding willingness	2.038	1.962	0.000

Table 7. Expert advice indicators matrix for the identified key factors for passenger boarding willingness for regional low-cost carrier routes.

The Average Expert Advice Matrix of Indicators	Service Quality—Tangibility	Service Quality—Reliability	Service Quality—Responsiveness	Service Quality—Assurance	Service Quality—Empathy	Switching Cost	Boarding Willingness
Service quality—tangibility	0.000	1.942	2.154	2.212	2.385	1.865	1.906
Service quality—reliability	2.077	0.000	1.904	2.154	2.058	1.769	2.173
Service quality—responsiveness	2.058	2.404	0.000	2.308	2.231	2.212	2.096
Service quality—assurance	1.827	2.269	2.058	0.000	2.038	2.212	2.019
Service quality—empathy	1.846	2.231	2.212	2.192	0.000	1.981	2.385
Switching cost	1.692	1.981	2.212	1.942	1.731	0.000	2.327
Boarding willingness	1.942	2.077	1.923	2.365	2.250	2.115	0.000

Step 3. Normalized average expert advice matrix

The normalized average expert advice matrix was calculated as the normalized average expert advice matrix, A, where r = the maximum sum values of row vectors and the column vectors of the average expert advice matrix A, and $s = 1/r$. Since $D = s * A$, (3) was available to obtain the normalized average expert advice matrix D. Tables 8 and 9 show the lting normalized average expert advice and normalized average expert advice indicators matrices, respectively.

Table 8. Normalized expert advice matrix for the identified key factors for passenger boarding willingness for regional low-cost carrier routes.

The Normalized Average of Dimensions Expert Advice Matrix	Service Quality	Switching Cost	Boarding Willingness
Service quality	0.000	0.447	0.553
Switching cost	0.438	0.000	0.473
Boarding willingness	0.469	0.451	0.000

Table 9. Normalized expert advice indicators matrix for the identified key factors for passenger boarding willingness for regional low-cost carrier routes.

The Normalized Average Expert Advice Matrix of Indicators Advice Matrix	Service Quality—Tangibility	Service Quality—Reliability	Service Quality—Responsiveness	Service Quality—Assurance	Service Quality—Empathy	Switching Cost	Boarding Willingness
Service quality—tangibility	0.000	0.146	0.162	0.166	0.179	0.140	0.143
Service quality—reliability	0.156	0.000	0.143	0.162	0.155	0.133	0.163
Service quality—responsiveness	0.155	0.181	0.000	0.173	0.168	0.166	0.157
Service quality—assurance	0.137	0.171	0.155	0.000	0.153	0.166	0.152
Service quality—empathy	0.139	0.168	0.166	0.165	0.000	0.149	0.179
Switching cost	0.127	0.149	0.166	0.146	0.130	0.000	0.175
Boarding willingness	0.146	0.156	0.144	0.178	0.169	0.159	0.000

Step 4. Total influence relationship matrix

The total influence relationship matrix was calculated as (4), where I is the identity matrix. Tables 10 and 11 show the resulting total influence and total influence of indicators matrices, respectively.

Table 10. Total influence matrix for the identified key factors for passenger boarding willingness for regional low-cost carrier routes.

Dimension The Total Influence Relevance Matrix	Service Quality	Switching Cost	Boarding Willingness
Service quality	5.418	5.686	6.242
Switching cost	5.388	5.046	5.843
Boarding willingness	5.442	5.396	5.565

Table 11. Total influence matrix of indicators for the identified key factors for passenger boarding willingness for regional low-cost carrier routes.

Indicator The Total Influence Relevance Matrix	Service Quality—Tangibility	Service Quality—Reliability	Service Quality—Responsiveness	Service Quality—Assurance	Service Quality—Empathy	Switching Cost	Boarding Willingness
Service quality—tangibility	2.022	2.375	2.314	2.428	2.363	2.256	2.371
Service quality—reliability	2.109	2.193	2.248	2.370	2.292	2.199	2.332
Service quality—responsiveness	2.270	2.527	2.297	2.562	2.478	2.395	2.508
Service quality—assurance	2.133	2.382	2.298	2.274	2.332	2.264	2.367
Service quality—empathy	2.197	2.449	2.373	2.486	2.267	2.317	2.456
Switching cost	2.053	2.285	2.228	2.319	2.235	2.046	2.303
Boarding willingness	2.175	2.410	2.329	2.465	2.383	2.297	2.274

Step 5. Causality chart

Total influence values below thresholds (dimension = 5.559, indicator = 2.312) were set as zero to eliminate weakly influencing dimensions or indicators and simplify the total influence matrices,

as shown in Tables 12 and 13, respectively. Tables 14 and 15 show the causality charts derived from the simplified matrices in Tables 11 and 12, respectively (5,6).

Table 12. Simplified total influence matrix for the identified key factors for passenger boarding willingness for regional low-cost carrier routes.

The Total Relationship Matrix with Dimensional Vision Simplified	Service Quality	Switching Cost	Boarding Willingness
Service quality	0.000	5.686	6.242
Switching cost	0.000	0.000	5.843
Boarding willingness	0.000	0.000	5.565

Table 13. Simplified total influence matrix of indicators for the identified key factors for passenger boarding willingness for regional low-cost carrier routes.

The Total Influence Relationship Matrix with Indicator Vision Simplified	Service Quality—Tangibility	Service Quality—Reliability	Service Quality—Responsiveness	Service Quality—Assurance	Service Quality—Empathy	Switching Cost	Boarding Willingness
Service quality—tangibility	0.000	2.375	2.314	2.428	2.363	0.000	2.371
Service quality—reliability	0.000	0.000	0.000	2.370	0.000	0.000	2.332
Service quality—responsiveness	0.000	2.527	0.000	2.562	2.478	2.395	2.508
Service quality—assurance	0.000	2.382	0.000	0.000	2.332	0.000	2.367
Service quality—empathy	0.000	2.449	2.373	2.486	0.000	2.317	2.456
Switching cost	0.000	0.000	0.000	2.319	0.000	0.000	0.000
Boarding willingness	0.000	2.410	2.329	2.465	2.383	0.000	0.000

Table 14. Causality chart of dimensions corresponding to the simplified total influence matrix.

Dimension	Sum of Rows	Ranking	Sum of Columns	Ranking	$d + r$ (Relevance)	Ranking	$d - r$ (Cause Degree)	Ranking
Service quality	16.249	2	17.347	1	33.596	2	1.098	1
Switching cost	16.128	3	16.277	3	32.405	3	0.150	2
Boarding willingness	17.651	1	16.403	2	34.054	2	−1.247	3
Average					33.351			

Table 15. Causality chart of indicators corresponding to the simplified total influence matrix.

Indicator	Sum of Rows	Ranking	Sum of Columns	Ranking	$d + r$ (Relevance)	Ranking	$d - r$ (Cause Degree)	Ranking
Service quality—tangibility	14.959	7	16.130	4	31.089	7	1.171	1
Service quality—reliability	16.621	2	15.744	6	32.365	5	−0.876	7
Service quality—responsiveness	16.087	5	17.038	1	33.124	1	0.951	2
Service quality—assurance	16.903	1	16.048	5	32.952	2	−0.855	6
Service quality—empathy	16.349	4	16.545	3	32.894	4	0.195	3
Switching cost	15.775	6	15.468	7	31.242	6	−0.307	5
Boarding willingness	16.611	3	16.333	2	32.944	3	−0.278	4
Average					32.373			

We used DEMATEL to explore key factor causality and relevance with the following findings.

1. Dimensional relevance for service quality and boarding willingness were located on the right side of the averages ($d + r >$ average 33.351). The degree of relevance was beyond those on the left side of the switching cost.
2. Dimensional reason degree: "service quality" and "switching cost" belonged to the category of "cause" ($d - r$ value > 0). "Boarding willingness" belonged to the affected category ($d - r$ cause degree values < 0). Therefore, both "service quality" and "switching cost" affected "Boarding willingness". Especially, "service quality" showed higher degrees of influence.
3. Indicator relevance: "service quality—responsiveness", "service quality—empathy", "service quality—assurance", and "boarding willingness" were located on the right side of the average

($d + r$ relevance > the average indicator at 32.573). The higher degrees of relevance in "service quality—tangibility", "service quality—reliability", and "switching cost" were located on the left side of the average ($d + r <$ average).

4. Indicator reason degree: "service quality—empathy", "service quality—responsiveness", and "service quality—tangibility" ($d - r$ cause degree value > 0) belonged to resultant indicators. For "service quality—assurance", "boarding willingness", and "switching cost" ($d - r$ reason value < 0), they belonged to the affected category.

5. Conclusions

Low-cost carrier service quality differs from that for other service industries. Passenger willingness to board and LCC service quality were closely related since service quality affects business operational performance [48]. Service quality for LCCs could not be directly compared with that for FCCs because their operating characteristics are intentionally different: LCCs focus on reduced costs and expenses while maintaining profit growth, to provide passengers with lower fares.

This study directly contacted passengers taking LCCs from Shanghai Pudong airport to participate in a questionnaire probing service quality, switching cost, and boarding willingness. We used the FDM to identify key factors for passengers choosing regional LCC routes, and DEMATEL to explore the factors' causality and relevance for passenger choice. The research results were as described below.

1. FDM successfully identified key factors for passengers choosing regional LCC routes.
2. LCC service quality improvement. We found the highest significance for service quality empathy, responsiveness, and assurance. Thus, passengers attached great importance to LCC capability to cope with problems, complaints, unexpected situations, protecting passenger rights, and innovative service. However, passengers showed the second lowest effect for service quality tangibility and reliability, and the lowest for switching cost. LCCs, similar to most industries, continually change on a daily basis, and aviation staff uniforms, cabin equipment, and website ordering convenience and security have enormously improved in recent years. On the other hand, LCC passengers generally must pay extra for meals, luggage check-in, and insurance, and this is generally accepted on the ground, in contrast to the service provided by traditional FCCs. Therefore, service quality emphasis was one of the important factors for passengers in evaluating carriers and could directly influence passenger willingness to board and switch. Therefore, passengers still hold expectations regarding overall LCC service quality. Thus, increased passenger boarding willingness should be further researched to enhance LCC success.
3. Key factors to enhance low-cost carriers. Passengers showed strongly positive relationships between service quality responsiveness and empathy, and boarding willingness. Thus, although passengers paid relatively low prices, they still expected excellent handling and quick responses from crews to cope with urgent situations and demands.
4. Discover cheaper fares and save time. It is critical that airlines recognize that passengers taking LCCs have different concerns regarding their travel from those taking traditional FCCs. Thus, for LCCs to survive in the market, they need to enhance their services. They should offer more incentives for passengers to choose LCCs but reduce the perceived gap with traditional FCCs, increasing consumer acceptance and hence enticing them to continuously take LCCs.

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