



Passenger Perceptions towards Service Quality of Airlines Based in Singapore

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ABSTRACT

This research focuses on understanding how passengers had perceived airline's flight services as well as how passengers had evaluated the importance of service quality dimensions of airlines based in Singapore, specifically understanding whether full-service network carriers or low-cost carriers had delivered better value-added service quality in terms of whether airfares were value for money, as well as identifying whether gender and age differences perceive differently towards service quality. Data was collected via a survey at Singapore's Changi Airport, targeting arriving passengers who had flown on Singapore-based airlines. The results revealed that full-service network carriers had delivered better value in flight services as compared to low-cost carriers. The results also highlighted that between genders, male passengers are more satisfied with airline's flight services as compared to females, while between age groups, significant differences were found in overall seat comfort. Moreover, Airline safety records and on-time departure and arrival followed by lavatories cleanliness and odourless were rated as the most important factors towards passengers.

Keywords: Airfares, Service Quality Assessment, SERVQUAL, Singapore-based Airlines, Value-added Service

JEL Classifications: L93, M30, M31

1. INTRODUCTION

To remain competitive in an industry, it is of paramount importance that service providers render quality service to their customers (Abdullah et al., 2007). Customer loyalty is a source of competitive advantage and an important intangible asset to any organisations, particularly for airlines (Jiang and Zhang, 2016). In the highly competitive airline industry environment the provision of high-quality services to customers is the core competitive advantage for an airline's profitability and sustained growth (Kalaiarasan et al., 2015).

Excellent customer satisfaction is viewed as one of the greatest assets for airline's in today's competitive environment (Sanyal et al., 2016). Indeed, sustaining and improving service excellence in airline services is a crucial aspect in the airline business (Park et al., 2004). It is an area where passengers will either continue to

choose to fly with a particular airline or select another airline as the airline business is highly competitive. This is because multiple airlines can provide similar services and fly to similar destinations. Passengers insights and responses are generally based on their own individual perceived value towards a service as passengers have different backgrounds and professions that produce varied behaviours (Park et al., 2006a). These perceptions, therefore, have significant impacts on airline overall quality of service ratings.

The study of customer satisfaction has become a significant factor in the area of marketing as more businesses are trying to retain their customers so they can ensure their survival. In the global airline industry, there is typically more than one airline competing in domestic and international markets, as a result, competition is getting tougher (Munusamy and Chelliah, 2011). This research is focused on the investigation of customer satisfaction in Singapore's air travel market. The objective of the study was to obtain the

perception of the customer service provided by Singapore Airlines, Silkair, Jetstar Asia and Scoot. Singapore Airlines and Silkair have adopted the full-service network carrier (FSNC) business model, whilst Jetstar Asia and Scoot have adopted the low-cost carrier business model (LCC). In order to achieve the study's objectives several research questions were carefully framed. The primary research question was:

1. How do passengers perceive airline flight services between FSNCs and LCCs in Singapore through a service quality assessment?

To further enhance the research study, several secondary questions were also investigated to provide greater depth of understanding on the research topic. The secondary questions addressed in the study were:

2. What are the types and attributes of services passengers expect and perceived for from a FSNC in terms of the value of airfares paid?
3. What are the types and attributes of services passengers expect and perceived for from a LCC in terms of the value of airfares paid?
4. How is service quality evaluated by passengers of certain age and gender?

2. LITERATURE REVIEW

2.1. Service Quality in Airline Business Industry

Due to the emergence of low-cost carriers (LCCs) in the airline business, air travel standards have transformed significantly while at the same time, putting intense pressure on existing traditional full-service network carriers (FSNCs) in a more challenging business environment. It has intensified the market through providing better value for passengers through competitive airfares in conjunction with competent quality of service (Lin and Huang 2015). Extensive studies have defined service quality differently in the airline business. According to Jiang (2013a), passengers defined and evaluated airline service quality through their purpose of travel. Park et al. (2009) mentioned that passengers from different country of origins defined and rated service quality differently towards airline services. Oyewole (2001) identified that passenger's with different marital status perceived service quality differently. Similarly, Sultan and Simpson (2000) noted that passengers with different nationalities perceived service quality differently.

Charoensettasilp and Wu (2014) studied passengers' gender, age, education level, monthly income and occupation and the authors found that these factors did not affect service quality on low-cost carriers (LCCs). Fourie and Lubbe (2006) observed that business passengers have different perceptions of service quality when choosing airlines in South Africa and the authors highlighted that ticket pricing and flight frequencies were influential factors in customer choice of their desired airline. These studies indicate that passengers with differed demographic backgrounds perceived airline service quality differently. Although several demographic backgrounds had differed perceptions, Gourdin and Kloppenborg (1991) mentioned that there were similar perceptions towards service quality between passengers and airline managers in the airline industry. Both passengers and managers concurred that convenient passenger check-in and flight connections, passenger

comfort during on-board delays, on time flight departures, beverage services on long-haul flights, clean aircraft, prompt service and baggage handling, responsive lost bag procedure as well as maintenance of passenger complaints were critical factors for quality service in the air travel industry. Furthermore, several researchers have defined service quality as a factor for passengers when choosing airlines. Kurtuluşoğlu et al. (2016), for instance, discovered that ticket prices, airline punctuality, and booking convenience were passengers selection factors when choosing their preferred airline.

However, O'Connell and Williams (2005) found that there were variances in service preferences between an LCC and a FSNC passengers. The study highlighted that airfares and flight schedules were preferred on LCCs while reliability and service quality were preferred on FSNCs. Additionally, Juliano and Keith (2011) discovered that passengers preferred frequent flyer programme (FFP) and destination distance on FSNCs while price, flight schedule and airport location were preferred on LCCs. More so, several studies have found that there are differences in service quality response and satisfaction towards LCCs and FSNCs (Chiou and Chen 2010; Kos Koklic et al., 2017). In contrast, there were no variances in service preferences between two low-cost carriers in China (Jiang, 2013b). Parasuraman et al. (1985) defines it clearly as the space between service expectations and service satisfaction. This describes plainly that services provided by the airlines naturally should match customers' service expectancy.

There have also been some studies that have examined passenger's behavioural intentions and preferences towards service quality (Rajaguru 2016). Buaphiban (2015) noted that passenger behaviours had a positive influence on passengers purchasing habits and that perceived service quality influenced their choice of airline. Yang et al. (2012) also identified that service preferences on an LCC had effects on passengers behaviours. Additionally, Park et al. (2006b) identified that perceived value, perceived price, passenger satisfaction and airline image had effects on passenger behaviours for future re-purchasing of tickets. However, according to a study from Park et al. (2004), quality of service has direct effects on passengers' decision-making process and perception towards services on a FSNC or LCC.

2.2. Measuring the Value of Service Quality

Perceived value of a service can be acknowledged as the overall impression received from the service on whether the money spent on the service was satisfactory and reasonable (Rajaguru 2016). Several researches have examined the relationship and impacts of value and quality issues in the airline industry. Chow (2014) measured service quality through examining customer complaints on 12 Chinese airlines and found that there were differences in perceptions between privately owned airlines and state-owned airlines. Moreover, Tsafarakis et al. (2017) measured service quality and customer satisfaction using a Multicriteria Satisfaction Analysis Tool that combines accessing customer satisfaction and suggesting improvements on service quality.

According to Zeithaml (1988), the value of service quality should naturally measure the consumers' overall evaluation of a service

based solely on the consumer's perception of the service delivered. In practical terms, value can be evaluated as value for money and can be particularly defined as a trade-off between ticket price and service received (Kashyap and Bojanic 2000). Several other studies have found that perceived value is a predecessor towards value for money, passenger satisfaction, and behaviours (Lai and Chen 2011; Yang et al. 2012). Moreover, Jiang and Zhang (2016) found that airline ticket prices had positive effects on passenger's overall satisfaction. However, other studies have concluded that quality provided from a service has positive effects on perceived value and can therefore be deemed as an ideal gauge to measure the gap between ticket price paid and service quality that was provided (Kashyap and Bojanic 2000; Rajaguru 2016; Zeithaml 1988). Furthermore, studies by Etamad-Sajadi et al. (2016); Han et al. (2012); Park et al. (2006a) stated that in order to enhance passenger satisfaction, loyalty and ensure passengers return, pre-flight and in-flight services must be examined as these were considered distinct factors of service quality. Chen and Hu (2013) also found that passenger loyalty is dependent on service quality. Besides, Mohammad Mehdi et al. (2013); Ostrowski et al. (1993) found that by improving pre-flight services, in-flight catering, and in-flight services, it will ultimately improve airline service quality standards. Hence, hypotheses in this study were formulated on individual flight services before, during and after the flight so as to identify perceptions of service quality attributes with regards to value of service (Gilbert and Wong 2003; Jiang, 2013a; Jiang et al., 2017; Namukasa, 2013 Young et al., 1994).

2.3. Categorising Service Quality into a Model

One of the most critical aspects for airlines to remain competitive in the airline business is its service quality and the passengers' overall impression and judgement of the services provided (Namukasa 2013). As a conceptual theory, service quality has been a topic reviewed intensively as it regarded as a source of competitive advantage for airlines (Nejati et al, 2009). Several study findings tried to classify airlines' service quality through countless means; however, it typically revolves around meeting passenger's expected service satisfaction and how well services are delivered to match passengers' expectations (Jiang et al., 2017). Kos Koklic et al. (2017) have classified airline service quality through managing customer service, staff quality, service satisfaction and recommending the airline to others. Young, Cunningham and Lee (1994) had categorised airline service quality in terms of baggage handling, passenger offloading (often called "bumping") procedures, operations and safety, in-flight comfort and flight connections. Hussain, Al Nasser and Hussain (2015) classified service quality through perceived value and branding, that reveals impacts towards consumer satisfactions and loyalty.

More so, Clemen et al. (2008) revealed that service quality has its own structural dimensions. Many studies have applied and identified service quality dimensions differently. Erdil and Yıldız (2011) had examined measurement scales to measure service quality using either SERVPERF or SERVQUAL measurement scale. However, a study by Parasuraman, Zeithaml and Berry (1985) has been widely researched to assess quality of service using the SERVQUAL 'RATER' model: reliability, assurance, tangibles, empathy and responsiveness. Several researchers had

applied this instrument to measure quality of service in the airline industry (Sultan and Simpson 2000). According to studies from Chen and Chang (2005); Jiang (2013b); Natalisa and Subroto (2003), SERVQUAL dimensions had positive effects on passenger satisfactions indicating that 'Assurance' had the strongest effect towards passenger satisfaction and selection of airline services. A study by Ali et al. (2015) examined service quality using 5 service quality dimensions: airline tangibles, terminal tangibles, personnel, empathy and image.

Moreover, Aydin and Yildirim (2012) used the same dimensions to determine the gap between passengers' perceptions and expectations towards airline services and found disparities on different domestic airlines in Turkey's airline industry. However, the "RATER" model used was not airline industry-specified. Gilbert and Wong (2003) altered the model to include seven dimensions (assurance, flight patterns, reliability, responsiveness, employees, facilities and customisation) as these better reflects the characteristics of the airline business. Hussain, Al Nasser and Hussain (2015) had applied the model and modified it to investigate a Dubai-based airline. Ganiyu Rahim (2016) had also modified the model to investigate airline service quality in the Nigerian airline industry. Similarly, Jiang et al. (2017) had applied it to China's domestic airline industry. Hence, this study will utilize the service quality dimensions modified by Gilbert and Wong (2003) as it targets its importance of the airline business aspects towards passengers.

2.3.1. Service quality dimensions

As seen in Table 1, there are 7 SERVQUAL dimensions namely: Assurance, Flight timetable, Reliability, Timely response of airline, Airline employees, Facilities and services, and Airline's response to changes and customizations. These dimensions was applied accordingly from a study by Gilbert and Wong (2003) and each dimension was then divided to target specific aspects of the airline's business to identify importance towards passengers.

Table 1: Service quality dimension factors.

Service quality dimensions	Corresponding factors
Assurance	Airline safety records Employee standard and capabilities
Flight timetable	Flight schedules Flight frequencies Flight network Departure timings Arrival timings
Reliability	On-time departure and arrival Service consistency
Timely response of airlines	Efficient service Prompt handling of requests or complaints
Airline employees	Employee's appearance Employee's attitude Employee's courtesy and politeness
Facilities and services	Baggage handling services In-flight facilities Waiting lounges Lavatories cleanliness and odourless
Response to changes and customisations	Individual attention from employee Anticipation of passengers' travel needs

3. METHODOLOGY

3.1. Research Design

The methodology developed in this study utilises a descriptive method using a quantitative analysis technique through the conduct of surveys. The survey obtained, derives a proportion of population who had flown on Singapore-based airlines and identifies how they perceive quality of service delivered by these airlines. The survey instrument also sought to establish the respondents perceived importance of service quality dimensions of airlines upon which they had flown on.

3.2. Data Collection

To ensure authenticity and originality of the respondent's perceptions towards quality of service, a structured and self-administered questionnaire was used to collect actual passengers' response at Singapore's Changi Airport. The survey was conducted in the airport's landside areas, specifically at arrival halls of Terminal 1 and Terminal 2 to target incoming passengers on arriving Singapore-based airlines flights.

The survey was conducted sparingly between 22nd March 2018 and 2nd April 2018 and utilised a judgement sampling technique (Wrenn et al., 2007) to target passengers who had flown on Singapore Airlines, Scoot, SilkAir or JetStar Asia Airways. The survey was structured into 4 sections, consisting of a total of 20 questions containing passenger demographics, flight details, flight services factors affecting service quality as well as factors representing the service quality dimensions. Questions were designed using the Likert scale ranging from 1 to 5, with 5 representing "Strongly agree" and "Very important", and 1 representing "Strongly disagree" and "Not important at all." Section A of the questionnaire focused on the passenger demographics, Section B asks about passenger flight information, Section C focus on perceptions towards airlines' flight services before, during and after the flight and lastly, Section D inquires passenger perceptions towards service quality dimensions on airlines.

To assure survey questionnaires are in-order, a pilot study was performed (Fox and Saheed Bayat, 2007; Seidman, 2006; Shekedi, 2005). Minor mistakes were identified and changes were made to the questions in section D where the Likert scale numbered 5 representing "Strongly agree" was replaced to "Very important, 4 "Agree" was replaced to "Important," 3 remains "Neutral," 2 "Disagree" was replaced by "Not important" and 1 "Strongly disagree" replaced by "Not important at all". These changes were made to suit the questions asked in Section D.

3.3. Data Analysis Method

The data obtained from the survey, was analysed using Microsoft Excel. A descriptive method was specifically used to examine and illustrate the data through means, standard deviations to find out the *p*-value before concluding whether the results showed any statistical difference.

In addition, student t-tests and analysis of variance (ANOVA) were utilised to determine whether a statistically significant difference exists between two means and three or more means, respectively (De Muth, 2014; Rick Turner and Thayer, 2001). The standard

significance level of 0.05 (95% confidence level) was applied to identify whether results were statistically significant.

The equation that was used to calculate ANOVA to calculate three or more means are as follows:

$$F = \frac{\text{Explained variance}}{\text{Unexplained variance}}$$

Or

$$F = \frac{\text{Between-group variability}}{\text{Within-group variability}}$$

The "explained variance", or "between-group variability" is:

$$\sum_{i=1}^K n_i (\bar{Y}_i - \bar{Y})^2 / (K - 1)$$

The "unexplained variance," or "within-group variability" is:

$$\sum_{i=1}^K \sum_{j=i}^{n_i} (Y_{ij} - \bar{Y}_i)^2 / (N - K)$$

The equation that was used to calculate T-test between two means is as follows:

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{S_1^2}{N_1} + \frac{S_2^2}{N_2}}}$$

4. RESULTS AND ANALYSIS

4.1. Data

Figure 1 presents the 149 respondents' responses of the survey questionnaires in Section A and B of the survey instrument. It presents the demographic questions reflecting passenger's gender, age, country of origin and education level, as well as respondents' response on purpose of travel, which airline they had travelled on and finally, the cabin class these passengers had travelled in on their flight (Appendix A).

Figures 1-3 displays respondent results from questions in Section C. These questions inquired about passengers' perceptions of factors in airline flight services, specifically, services before, during and after each flying experience. As previously noted, questions applied used the Likert scale ranging from "Strongly agree" as (5), "Agree" as (4), "Neutral" as (3), "Disagree" as (2) and "Strongly disagree" as (1) (Monette et al., 2011). Figure 2 reflect passengers' response on the 6 factors of pre-flight services. Among these factors, most of the passengers "agree" that ticket booking convenience (54.9%), customer service response (47.4%), check-in counters (54.2%), baggage handling (55.6%) and airport lounges (39.1%) met their expectations on the airfares paid. 46.6% passengers "agree" that the 6 factors had satisfied their overall flying experience. Very few passengers "strongly disagree" and "disagree" that the 6 factors of their pre-flight services met their service expectations on whether they are value for money or had satisfied their overall flying experience after their flight.

Figure 3 shows the response on the 7 in-flight services factors. Among all the factors, the majority of passengers 'agree' that in-

Figure 1: Passenger demographic proportions, gender, age, and airline (including business model), n = 149

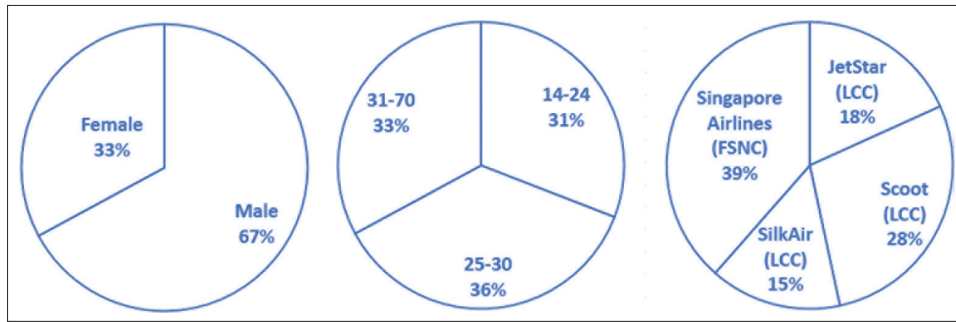


Figure 2: Box and whisker plots for pre-flight services. (1) Ticket booking convenience, (2) Customer service response, (3) Check-in counters, (4) Baggage handling, (5) Airport lounges, and (6) Overall satisfaction

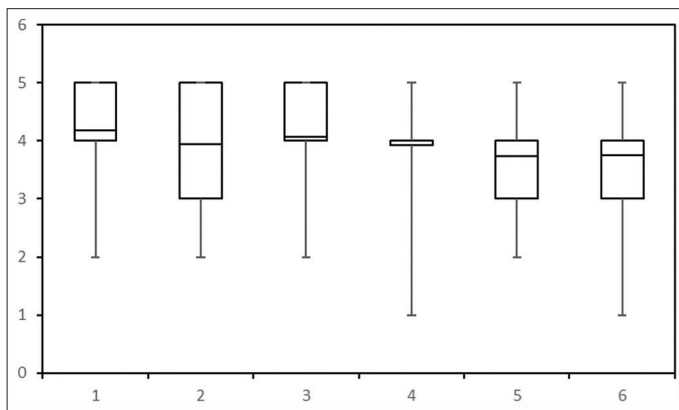
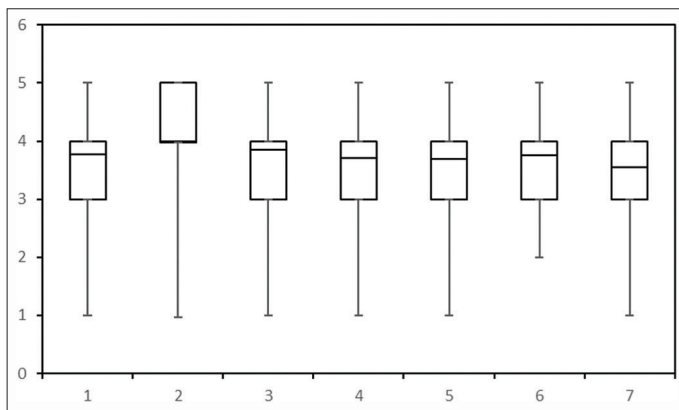


Figure 3: Box and whisker plots for inflight services. (1) In-flight entertainment, (2) Flight attendant courtesy and assistance, (3) Seat comfort and cleanliness, (4) Seat space and legroom, (5) Food and beverages, (6) Variety of newspaper and magazines, and (7) Overall satisfaction on flying experience



flight entertainment (IFE) (35.3%), flight attendant courtesy and assistance (50.3%), seat comfort and cleanliness (50.4%), seat space and legroom (42.9%) and food and beverages (41.4%) met their expectations on the airfares paid. 44.4% of passengers ‘agree’ that the 7 factors had satisfied their overall flying experience. However, passengers felt that the variety of newspaper and magazines (37.6%) neutrally met their service expectations on whether they are value for money. Very few passengers ‘strongly disagree’ and ‘disagree’ that the 7 factors of pre-flight services met

their service expectations on whether they are value for money or had satisfied their overall flying experience.

Figure 4 shows the passengers’ response on the 6 post-flight services factors. Among these factors, the majority of the passengers “agree” that baggage claim convenience (50.3%), time-taken for baggage retrieval (47.3%), ground staff assistance (42.1%) and clear signage for orderly movement (45.9%) met their expectations on the airfares paid. 48.9% of passengers ‘agree’ that the 6 factors had satisfied their overall flying experience. However, passengers felt that the courtesy of baggage claim employee neutrally (39.85%) and arguably “agree” (39.85%) that the service met their service expectations on whether they are value for money. Very few passengers “strongly disagree” and “disagree” that the 6 factors of pre-flight services met their service expectations on whether they are value for money or had satisfied their overall flying experience.

Figure 5 displays passengers’ responses on questions from Section D of the survey. The questions inquired as to the importance of the 7 airline’s service quality dimensions towards passengers, and the corresponding 21 factors considered (Table 1).

For airline’s assurance, a significant 81.2% of total passengers perceived that airline’s safety records were very important to them while 18% of them felt important, and only 1 passenger felt neutral on this aspect. Under employee’s standards/capabilities, 48.1% of total passengers perceived that employee’s standards and capabilities were very important to them while 39.9% of them felt important and remaining 12% felt neutrality.

For airline’s flight timetable, 53.4% of total passengers perceived that airline’s flight schedules were very important to them, with 36.8% of them perceived important, 9% felt neutrality and only 1 passenger felt it was not important. As for flight frequencies, 42.8% of total passengers felt airline’s flight frequencies were very important to them, with 42.1% of them perceived important, 12.0% felt neutrality while observing 2.3% of them felt it was not important and unexpectedly, only 1 passenger felt it wasn’t important at all. As for flight network, 41.4% of total passengers felt airline’s flight network were very important to them, with 40.6% of them perceived important, 15.0% felt neutrality while seeing the remaining 3% of passengers felt it was not important to them. Under departure timings, a significant 72.9% of total passengers felt it was very important to them, with 23.3% of them perceived important, 3% felt neutrality and unexpectedly 1 passenger felt it

Figure 4: Box and whisker plots for post-flight services. (1) Baggage claim convenience, (2) Courtesy of bag claim employee, (3) Time-taken for baggage retrieval, (4) Ground staff assistance, (5) Clear signage for orderly movement, and (6) Overall satisfaction

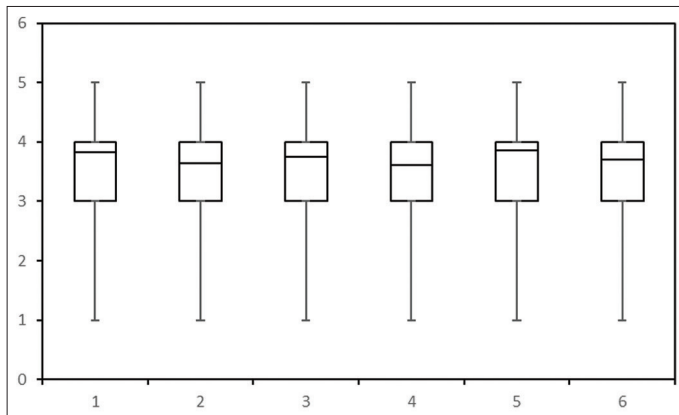
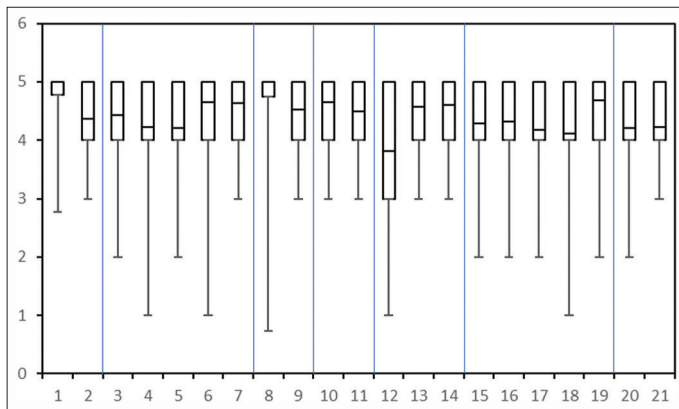


Figure 5: Box and whisker plots for service quality dimensions. SQ1 - Assurance: (1) Airline safety records, (2) Employees standards/capabilities; SQ2 - Flight Timetable: (3) Flight schedules, (4) Flight frequencies, (5) Flight network, (6) Departure timings, (7) Arrival timings; SQ3 – Reliability: (8) On-time departure/arrival, (9) Service consistency; SQ4 - Timely response of the airline: (10) Efficient service, (11) Prompt handling of requests or complaints; SQ5 - Airline’s employee characteristics: (12) Employee’s appearance, (13) Employee’s attitude, (14) Employee’s courtesy and politeness; SQ6 - Airline’s facilities and services: (15) Check-in counters, (16) Baggage handling services, (17) In-flight facilities, (18) Waiting lounges, (19) Lavatories cleanliness and odourless; SQ7 - Airline’s response to changes and customization: (20) Individual attention from employee, and (21) Anticipation of passenger’s travel needs



was not important at all. Under arrival timings, a significant 71.4% of total passengers felt it was very important to them, with 26.3% of them perceived important and only 2.3% of them felt neutrality.

For airline’s reliability, 81.2% of total passengers perceived that on-time departure/arrival were very important to them, with 16.5% of them perceived important, 1.5% felt neutrality while only 1 passenger felt it was not important at all. As for service consistency, 58.7% of total passengers felt that airline’s service consistency was very important to them, with 36.8% of them perceived important and the remaining 4.5% of passengers felt neutrality towards airline’s service consistency.

For timely response of the airline, 66.9% of total passengers perceived that efficient service of the airline were very important to them, while 32.3% of them perceived important and only 1 passenger felt neutrality towards the importance of airline’s efficient service. As for airline’s prompt handling of requests/complaints, 55.6% of total passengers felt it was very important to them, while 38.4% perceived important, and the remaining 6% felt neutrality towards it. Under airline’s employee characteristics, 33.1% of total passengers perceived that the appearance of airline’s employees was very important to them, while 31.6% felt important, 18.8% felt neutrality, 15% felt it was not important to them and the remaining 1.5% felt it was not important at all. As for employee’s attitude, 61.7% of total passengers felt employee’s attitude towards them were very important, while 34.6% felt it was important and the remaining 3.7% of passengers felt neutrality towards airline’s employees’ attitude. As for employee’s courtesy and politeness, 63.9% of total passengers felt the courtesy and politeness of airline’s employees were very important to them, while 33.8% of them felt important and the remaining 2.3% felt neutrality towards airline’s employees’ courtesy and politeness.

For airline’s facilities and services, 44.4% of total passengers felt airline’s check-in counters were very important to them, while 41.3% of passengers felt important, 11.3% felt neutrality and the remaining 3% of passengers felt it was not important at all. As for baggage handling services, 46.6% of total passengers felt airline’s baggage handling services were very important to them, while 38.3% perceived important, 12.8% felt neutrality and the remaining 2.3% of passengers felt it was not important at all to them. As for in-flight facilities, 40.6% of total passengers felt airline’s in-flight facilities were very important to them, while 39.8 of these passengers felt important, 16.5% of them felt neutrality and the remaining 3% of passengers felt in-flight facilities was not important to them. As for waiting lounges, 36.1% of total passengers felt waiting lounges was very important to them, while 48.1% felt important, 11.3% felt neutrality, 3.7% felt it was not important and the remaining 1 passenger felt waiting lounges was not important at all. As for lavatories cleanliness and odourless, 74.4% of total passengers felt it was very important to them, while 22.6% felt important and the remaining 3% of passengers felt neutrality about it.

For airline’s response to changes and customizations, 37.6% of total passengers felt that individual attention from airline’s employee were very important to them, while 45.1% felt important, 16.5% felt neutrality and the remaining 1 passenger felt it was not important to have individual attention from airline’s employee. As for anticipation of passenger’s travel needs, 39.1% of total passengers felt it was very important for airlines to anticipate passenger’s travel needs, while 45.1% felt important and the remaining 15.8% of passengers felt neutrality in having airlines to anticipate passenger’s travel needs.

4.2. Flight Services

4.2.1. Pre-flight services

As show in Table 2, all pre-flight services’ factors: ticket booking convenience, customer service response, check-in counters, baggage handling, airport lounges and overall satisfaction showed

that there were significant positive average responses from the passengers (the 1 sample t-test). This confirms what is illustrated in Figure 2.

As shown in Table 2, there were no significant disparities found between genders (2 sample t-test) in terms of passenger check-in counters, baggage handling, airport lounges and overall satisfaction towards their flying experience. However, there were significant differences between males and females in terms of ticket booking convenience and customer service response. In general, the scores from male respondents were higher than those from female respondents. As such, for ticket booking and customer service, we can conclude at the 95% significance level that male passengers were more satisfied than female passengers.

As shown in Table 2, there were no significant differences between age groups in all factors of pre-flight services: ticket booking convenience, customer service response, check-in counters, baggage handling, airport lounges and overall satisfaction towards their overall flying experience. With 3 age groups, ANOVA was utilised in place of t-tests for age.

4.2.2. In-flight services

As show in Table 3, all in-flight services' factors: in-flight entertainment, flight attendant courtesy and assistance, seat comfort and cleanliness, seat space and legroom, food and beverages, variety of newspaper and magazines, and overall satisfaction showed that there were significant positive average responses from the passengers. This confirms what is illustrated in Figure 3.

As reflected in Table 3, all in-flight services' factors showed that there were significant differences between passengers who travelled with FSNCs and LCCs. That is, FSNC had a higher average than LCCs, at the 95% significance level.

As shown in Table 3, there were no significant differences between genders in all factors of in-flight services. As noted with pre-flight services, male passengers gave slightly more positive responses for all the in-flight services as well.

As shown in Table 3, there were no significant difference between age groups in terms of in-flight entertainment (IFE), flight attendant courtesy and assistance, food and beverages, variety of newspaper and magazines, and overall satisfaction towards flying experience. However, there were significant differences between age groups in terms of seat comfort and cleanliness, as well as seat space and legroom. For both factors, the 31 to 70 age group were more satisfied than those younger, at the 95% significance level.

4.2.3. Post-flight services

As can be observed in Table 4, all post-flight services' factors: baggage claim convenience, courtesy of bag claim employee, time-taken for baggage retrieval, ground staff assistance, clear signage for orderly movement, and overall satisfaction showed that there were significant positive average responses from the passengers. This confirms what is illustrated in Figure 4.

Table 2: Pre-flight services results between demographics

	1 Sample	LCC/FSNC	Gender	Age
Ticket booking convenience	<0.001*	0.0032*	0.017*	0.2382
Customer service response	<0.001*	<0.001*	0.0401*	0.1182
Check-in counters	<0.001*	<0.001*	0.0807	0.8682
Baggage handling	<0.001*	<0.001*	0.2978	0.5911
Airport Lounges	<0.001*	<0.001*	0.2267	0.2014
Overall satisfaction	<0.001*	<0.001*	0.201	0.9018

Table 3: In-flight services results between demographics

	1 Sample	LCC/FSNC	Gender	Age
In-flight entertainment	<0.001*	<0.001*	0.3466	0.0579
Flight attendant courtesy and assistance	<0.001*	<0.001*	0.9466	0.2036
Seat comfort and cleanliness	<0.001*	<0.001*	0.568	0.013*
Seat space and legroom	<0.001*	<0.001*	0.5403	0.0219*
Food and Beverages	<0.001*	<0.001*	0.2865	0.3622
Variety of newspaper and magazines	<0.001*	<0.001*	0.0688	0.6342
Overall satisfaction	<0.001*	<0.001*	0.066	0.6932

Table 4: Post-flight services results between demographics

	1 Sample	LCC/FSNC	Gender	Age
Baggage claim convenience	<0.001*	<0.001*	0.6895	0.2776
Courtesy of baggage claim employee	<0.001*	<0.001*	0.9773	0.1434
Time-taken for baggage retrieval	<0.001*	0.0174*	0.3743	0.1002
Ground staff assistance	<0.001*	0.0024*	0.2743	0.2804
Clear signage for orderly movement	<0.001*	0.0067*	0.0109*	0.3781
Overall satisfaction	<0.001*	0.0074*	0.1384	0.3363

In Table 4, all post-flight services' factors: baggage claim convenience, courtesy of baggage claim employee, time-taken for baggage retrieval, ground staff assistance, clear signage for orderly movement and overall satisfaction shows that there were significant disparities between passengers who travelled on FSNCs and LCCs. Again, at the 95% significance level, passengers who travelled with an FSNC were more positive than those passengers who travelled with an LCC.

Table 4 also shows that there were no significant disparities found between genders in baggage claim convenience, courtesy of baggage claim employee, time-taken for baggage retrieval, ground staff assistance as well as overall satisfaction towards flying experience. However, there were significant differences found between genders in terms of clear signage for orderly movement. Again, male passengers gave more positive responses than female passengers.

Table 4 also indicates that there were no significant differences between age groups in all post-flight services' factors: baggage

claim convenience, courtesy of baggage claim employee, time-taken for baggage retrieval, ground staff assistance, clear signage for orderly movement and overall satisfaction towards flying experience.

4.3. Service Quality Dimensions

In Section D of the survey, questions asked about the importance of service quality dimensions towards passengers. Based on the results shown in Appendix B, it was found that among all the factors in the dimensions, “Assurance” in airline safety records and “Reliability” of airline’s on-time departure and arrival were evaluated as the 2 most important factors towards passengers on Singapore-based air carriers. Lavatories cleanliness and odourless were evaluated subsequently followed by airline’s departure and arrival timings.

As with Section 4.2. a 1 sample T-test was used to analyse the average for all of the passengers surveyed in terms of their perceptions of the service quality dimension, and corresponding factors. To determine if there were any differences observed between the airline business model (FSNC or LCC), a 2-sample *t*-test was utilised; similarly, for gender. For age, with 3 groups, ANOVA was used to determine if there were any differences in passengers’ perceptions of the service quality dimensions based on their age. The results of these tests are summarised in Table 5.

The major results from Table 5 are that all dimensions (and factors) had a positive average amongst the entire survey population. For airline business model, all FSNC passengers gave more positive responses, and these were statistically significant for all

but airline safety record, flight departure timings, on-time flight departure and arrival, employee’s courtesy and politeness, and individual attention from employees. For gender, there was only one factor that was statistically significantly different, anticipation of passengers’ travel needs, which was surprisingly higher for female passengers. For the different age groups, there were 5 factors that had statistically significantly different averages. For the airline safety records, on-time departure and arrival, and lavatories cleanliness and odourless, older passengers were more positive. For efficient service, the passengers aged 25 to 30 were the most positive. For prompt handling of requests or complaints, the youngest age group had the most positive response.

5. DISCUSSIONS

5.1. Findings and Recommendation

Based on the results obtained using the student *t*-test to test the study’s hypotheses, there were significant differences between passengers who flew on FSNCs and LCCs in terms of all pre-flight, in-flight, and post-flight services’ factors. Passengers who flew on LCC airlines: Jetstar Asia Airways and Scoot, perceived that airline’s services in terms of all pre-flight, in-flight and post-flight services minimally met their expectations for the airfares they paid as well as satisfaction towards overall flying experience, when it was compared to passengers who flew on FSNCs even though none of the passengers disagree or strongly disagree in any factors. Also, based on the mean averages of all factors, passengers who had flown on FSNCs rated better value of airfares in terms of all airlines’ services meeting their expectations. Despite so, both FSNCs and LCCs should maintain their efforts to keep passengers’

Table 5: Services quality dimensions and corresponding factors results between demographics

	1 Sample	LCC/FSNC	Gender	Age
Assurance				
Airline safety records	<0.001*	0.522	0.222	0.026*
Employee standard and capabilities	<0.001*	0.022*	0.297	0.888
Flight timetable				
Flight schedules	<0.001*	0.001*	0.430	0.951
Flight frequencies	<0.001*	0.001*	0.692	0.448
Flight network	<0.001*	<0.001*	0.389	0.520
Departure timings	<0.001*	0.343	0.058	0.154
Arrival timings	<0.001*	0.006*	0.178	0.884
Reliability				
On-time departure and arrival	<0.001*	0.538	0.493	0.037*
Service consistency	<0.001*	0.019*	0.551	0.239
Timely response of airlines				
Efficient service	<0.001*	0.001*	0.841	0.025*
Prompt handling of requests or complaints	<0.001*	0.002*	0.923	0.027*
Airline employees				
Employee’s appearance	<0.001*	0.009*	0.245	0.121
Employee’s attitude	<0.001*	0.012*	0.183	0.494
Employee’s courtesy and politeness	<0.001*	0.069	0.845	0.501
Facilities and services				
Baggage handling services	<0.001*	0.003*	0.966	0.263
In-flight facilities	<0.001*	0.007*	0.384	0.080
Waiting lounges	<0.001*	<0.001*	0.282	0.342
Lavatories cleanliness and odourless	<0.001*	0.038*	0.406	0.011*
Individual attention from employee	<0.001*	0.457	0.808	0.719
Response to changes and customisations				
Anticipation of passengers’ travel needs	<0.001*	<0.001*	0.008*	0.546
Airline safety records	<0.001*	0.002*	0.137	0.315

expectations and satisfactions of service at reasonable levels to assure re-patronage of passengers.

As stated by Parasuraman et al. (1985), airline managers should look closely into minimising the gap between service expectations and service satisfaction of services they offer, specifically assuring that the airfares structure are reasonable and based on the flight service delivered. Based on the study findings, LCCs airline managers could better configure their pricing structure by specifically categorising add-ons or upgrades for each particular factor stated in pre-flight, in-flight and post-flight services. Through offering add-on services, passengers might end up purchasing these add-ons for better service quality which will ultimately better satisfy their flying experience. As reviewed, this method is known as ancillary services and today, most airlines had already proven to introduce unbundling and optional services which had somehow assisted to minimise the gap between service expectations and service satisfaction towards a service, and at the same time provide airlines with additional revenue (Westermann, 2012).

Based on the results obtained using the student t-test to test hypotheses between genders, there were significant differences found statistically between genders in terms of flight services concerning ticket booking convenience and customer service response before their flight, and clear signage for orderly movements after their flight. Females felt that before their flights, booking tickets was marginally convenient to them as compared to males. With the rise of e-commerce, a significant number of passengers purchase their air tickets online. A reason could be that female passengers were more concerned about risks and security of using the Internet or it could also be that the sites were complicated to navigate. Hence, a research study by Ahn and Lee (2011) produced certain recommendations for airline managers to improve measures of purchasing online flight tickets.

Ahn and Lee (2011) recommended that the procedure of purchasing of airline tickets should be easier and simplified; the main airline web page must allow purchase of tickets with a maximum of three clicks to make the entire process as rapid as possible to prevent passengers to be distracted. Also, the main web page should include “policy on consumers” personal information’ to bring consumer’s attention that the information provided are secured under security and privacy policies of the company. Lastly, the booking websites must always be updated consistently so that it would be secured and user-friendly for returning passengers to repurchase.

As for the next factor, females felt that customer service response before their flight marginally met their service expectations as compared to males. There could be unpleasant instances where female passengers encountered that provides conclusion of their perception towards airline customer service. Since every passenger have different needs prior to their flight, airline managers could consider designating some of their employees who are qualified in customer relations excellence and assign employees based on similar genders wherever possible.

Subsequently, females felt that the signage for orderly movements after the flight marginally met their expectations as compared to males. There could be many instances that females encountered after the flight with regards to airport signage. However, a study by Kim et al. (2017) indicated that airport designs in signage and directions for movements in the airport should cater to changes in human functioning caused by ageing of certain gender. Hence, as such, airlines should work closely with the Changi Airport Group management to ensure signages in the airport vicinity are clearer, bigger and readable words of common languages to assure orderly and swift movements of passengers of all ages as passengers tend to experience the underlying issues of traveling such as fatigue and restlessness after their flight as explained by Waterhouse et al. (2004).

Prior to results obtained using ANOVA to test hypotheses between age groups, there were significant differences found in terms of in-flight services concerning seat comfort and cleanliness, as well as seat space and legroom. Passenger in the “young” and “middle” group felt that airlines seat comfort and cleanliness, and seat space and legroom merely met their expectations on the airfares they paid as compared to passengers in the more ‘elderly’ age group. Younger passengers could be more conservative in spending for upgrades to better seat class as they may be earning lower incomes or still pursuing their studies. Hence, airlines could examine giving additional discounted air fares to student travellers to provide them with better comfort perceptions of seats.

Relating to a study by Urban et al. (2017), seat comfort is a critical aspect for passenger’s in-flight experience and overall comfort is dependent on seat’s width and pitch. This somehow presented a relationship towards airline’s business model. Generally, on a FSNC, seat pitch in economy is approximately 32-34 inches whereas in a LCC, seat pitch in economy is approximately 28-30 inches (Whyte and Lohmann, 2017).

As for the importance of SERVQUAL dimensions, “Assurance” of airline’s safety records and “Reliability” of airlines’ on-time-departure and arrival were rated as most important factors towards passengers. The result supports researches acknowledged by Clemes et al. (2008); Gilbert and Wong (2003); Natalisa and Subroto (2003) that “safety” in the airline industry has been very important and critical since “September 11 attack.”

Predictably, passengers rated highly towards lavatories cleanliness and odourless. This goes without saying as human beings tend to highlight this aspect as passengers may visit lavatories at least once during their flight. Hence, airlines should always ensure their lavatories are reasonably clean and odourless by installing additional air-fresheners to ensure a decent experience for passengers to use the lavatories.

Departure and flight arrival timings of airlines were shown to be the two next important factors. According to a study by Vlachos and Lin (2014), the authors indicated that airline punctuality is considered a basic requirement especially for business travellers as they are more time-sensitive. Additionally, Vlachos and Lin (2014) mentioned that punctuality is positively related to overall

satisfaction of their flying experience. Hence, airlines should try to stay within their scheduled departure and arrival timings as well as try to avoid unnecessary delays to prevent passengers' dissatisfaction which somehow assists airlines to reduce airline operating costs in fuel consumptions.

5.2. Limitations of Research Study

There were some limitations with the present study. Firstly, the research involved 2 low-cost carriers (LCCs) and 2 full-service network carriers (fSNCs). Among these 4 carriers, 3 of them are owned by the Singapore Airlines Group. The results may be potentially biased towards the three airlines: Singapore Airlines, SilkAir and Scoot have all historically had a reputation of producing high quality service standards and reliable service for passengers. Passengers who fly with Jetstar Asia Airways are typically passengers who prefer lower ticket price over flight services.

Also, all four airlines operate different route networks as these 4 airlines target different passenger market segments. Singapore Airlines' flights generally offer full-service on international long-haul flights, SilkAir offers full-service on domestic/regional flights, Scoot offers low-cost services on long-haul flights while Jetstar Asia offers low-cost services on domestic/regional flights. Hence, the results may be limited as respondents were derived from different market segments.

Moreover, the study was only limited to the 4 airlines based in Singapore. Hence, the respondents for this research were entirely based on passengers who had travelled on these 4 airlines at Singapore Changi Airport. The results could be dissimilar if more airlines and other international passengers who had travelled on other airlines participated in this research.

5.3. Future Research

Future research arising from this study could include all arriving airlines into Changi Airport since it operates as a hub-and-spoke transport hub. This work can be done to obtain more international passengers' perception towards service quality as well as focus on the other demographics' factors asked in the survey questionnaire specifically: country of origins, education levels and the cabin class the passengers had travelled in. By doing so, it may identify if there are any differences in perceptions towards airline's flight services and service quality dimensions framework based on these demographics. Subsequently, further studies could be conducted to include globally recognised FSNCs, such as Emirates, Qantas and Qatar Airways, and AirAsia and Cebu Pacific as LCCs, as this will provide a wider coverage of passenger perceptions towards airline's service quality.

6. CONCLUSION

The airline industry is a highly competitive and challenging environment. Consequently, for airlines to stay sustainable in their business, it is highly dependent on passengers' satisfaction of the airfares they paid towards the services of airlines. This research examines passenger perceptions towards the quality of service delivered on Singapore-based air carriers namely: Jetstar

Asia Airways, Scoot, SilkAir and Singapore Airlines. The study investigates specifically within flight services' factors in pre-flight, in-flight, post-flight as well as the importance of service quality dimensions of airlines. A survey questionnaire was constructed based on a factors of airline flight services as well as factors of SERVQUAL dimension model formed by Gilbert and Wong (2003). The survey was analysed through a series of quantitative analysis methods.

Based on the results, a clear outcome was illustrated that between two business models, passengers perceived differently on all factors before, during and after their flight. The results revealed that full-service network carriers (FSNCs) had delivered better value on flight services in comparison to low-cost carriers. Passengers rated better satisfaction towards meeting their expectations on a full-service network carrier (FSNC) as compared to low-cost carriers (LCCs). Moreover, the study results also highlighted that between genders, male passengers are more satisfied with airline's flight services as compared to females and identified that females were less satisfied on booking tickets, customer service response and clear signage for orderly movements as compared to males. Between age groups, all age groups rated high satisfaction towards services meeting their expectations however significant differences were found in overall seat comfort and cleanliness, as well as seat space and legroom.

Moreover, airline safety records and on-time flight departure and arrival followed by lavatories cleanliness and odourless were rated as the most important factors towards passengers who had flown on Singapore-based air carriers. To assist airlines specifically, the services in this research were distinctly detailed so that airlines can distinguish any specific factors that requires improvement and understand which aspects of service quality dimensions of airline are deemed important by the passengers.

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APPENDICES

Appendix A: Survey Questions

Section A: Passenger demographics

Questions	Options to Select	Select one from the options
Gender	Male	0
	Female	0
Age	Please list exact age	0
Country of origin	Please select from the list	0
Education level	No schooling completed	0
	Primary/Nursery to 8 th Grade	0
	High school, no diploma	0
	College credit, no degree	0
	Trade/Vocational training	0
	Associate degree	0
	Bachelor's degree	0
	Master's degree	0
	Professional degree	0
Doctorate degree	0	

Section B: Passenger flight information

Question	Options to select	Select one from the options
Please indicate purpose of travel	Work-related business	0
	Personal/private business	0
	Holiday	0
	Education/study	0
	Visiting friends/relatives	0
Please indicate which airline that you had travelled on the most	Singapore Airlines	0
	Silkair	0
	Scoot	0
Please indicate which cabin class that you had travelled in the most	Jetstar Asia Airways	0
	First class	0
	Business class	0
	Premium economy	0
	Economy	0

Section C: Reviewing airline's services, before, during and after flight

Aspect of customer experience	Strongly agree (5)	Agree (4)	Neutral (3)	Disagree (2)	Strongly disagree (1)
Pre-flight services					
Ticket booking convenience	0	0	0	0	0
Customer service response	0	0	0	0	0
Checkin counters	0	0	0	0	0
Baggage handling	0	0	0	0	0
Airport lounges	0	0	0	0	0
Overall satisfaction of services	0	0	0	0	0
In-flight services					
In-flight entertainment	0	0	0	0	0
Flight attendant assistance	0	0	0	0	0
Seat comfort and cleanliness	0	0	0	0	0
Seat space and legroom	0	0	0	0	0
Food and beverages	0	0	0	0	0
Variety of newspapers and magazines	0	0	0	0	0
Overall satisfaction of services	0	0	0	0	0
Post-flight services					
Baggage claim convenience	0	0	0	0	0
Courtesy of baggage claim staff	0	0	0	0	0
Time taken for baggage retrieval	0	0	0	0	0
Ground staff assistance	0	0	0	0	0
Clear signage for orderly movement	0	0	0	0	0
Overall satisfaction of services	0	0	0	0	0

Section D: Reviewing airline's business aspects in service quality

	Very important (5)	Important (4)	Neutral (3)	Not important (2)	Not important at all (1)
Airline's assurance					
Airline safety records	0	0	0	0	0
Employee's standards and capabilities	0	0	0	0	0
Airline's flight timetable					
Flight schedule	0	0	0	0	0
Flight frequencies	0	0	0	0	0
Flight network	0	0	0	0	0
Departure timings	0	0	0	0	0
Arrival timings	0	0	0	0	0
Reliability					
On-time departure/arrival	0	0	0	0	0
Service consistency	0	0	0	0	0
Timely response of the airline	0	0	0	0	0
Efficient service	0	0	0	0	0
Prompt handling of requests/complaints	0	0	0	0	0
Airline's facilities and services					
Check-in counters	0	0	0	0	0
Baggage handling services	0	0	0	0	0
In-flight facilities	0	0	0	0	0
Waiting lounges	0	0	0	0	0
Lavatories cleanliness and odourless	0	0	0	0	0
Airline's response to changes and customization					
Individual attention from employee	0	0	0	0	0
Anticipation of passenger's travel needs	0	0	0	0	0

Appendix B: Results of Importance of Service Quality Dimensions

Service quality corresponding factors	Very important	Important	Neutral	Not important	Not important at all	Total percentage/ total response
Airline's assurance						
Airline safety records	81.2%	18%	0.8%	0	0	100%
	108	24	1	0	0	133
Employee's standards and capabilities	48.1%	39.9%	12	0	0	100%
	64	53	16	0	0	133
Airline's flight timetable						
Flight schedule	53.4%	36.8%	9%	0.8%	0	100%
	71	49	12	1	0	133
Flight frequencies	42.8%	42.1%	12%	2.3%	0.8%	100%
	57	56	16	3	1	133
Flight network	41.4%	40.6%	15%	3%	0	100%
	55	54	20	4	0	133
Departure timings	72.9%	23.3%	3%	0	0.8%	100%
	97	31	4	0	1	133
Arrival timings	71.4%	26.3%	2.3%	0	0	100%
	95	35	3	0	0	133
Reliability						
On-time departure/arrival	81.2%	16.5%	1.5%	0	0.8%	100%
	108	22	2	0	1	133
Service consistency	58.7%	36.8%	4.5%	0	0	100%
	78	49	6	0	0	133
Timely response of airline						
Efficient service	66.9%	32.3%	0.8%	0	0	100%
	89	43	1	0	0	133
Prompt handling of requests/ complaints	55.6%	38.4%	6%	0	0	100%
	74	51	8	0	0	133
Airline employee characteristics						
Employee's appearance	33.1%	31.6%	18.8%	15%	1.5%	100%
	44	42	25	20	2	133
Employee's attitude	61.7%	34.6%	3.7%	0	0	100%
	82	46	5	0	0	133
Employee's courtesy & politeness	63.9%	33.8%	2.3%	0	0	100%
	85	45	3	0	0	133
Airline facilities and services						
Check-in counters	44.4%	41.3%	11.3%	3%	0	100%
	59	55	15	4	0	133
Baggage handling services	46.6%	38.3%	12.8%	2.3%	0	100%
	62	51	17	3	0	133
In-flight facilities	40.6%	39.8%	16.5%	3%	0	100%
	54	53	22	4	0	133
Waiting lounges	36.1%	48.1%	11.3%	3.7%	0.8%	100%
	48	64	15	5	1	133
Lavatories cleanliness and odourless	74.4%	22.6%	3%	0	0	100%
	99	30	4	0	0	133
Airline's response to changes and customization						
Individual attention from employee	37.6%	45.1%	16.5%	0.8%	0	100%
	50	60	22	1	0	133
	39.1%	45.1%	15.8%	0	0	100%
Anticipation of passenger's travel needs	52	60	21	0	0	133