

Quality evaluation of an Airline: A Modeling Approach

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Introduction

The delivery of high quality service became a marketing requirement among air carriers as a result of competitive pressure. Empirical studies on demand for airline services show that service quality is central to the choice of airlines for both business and leisure travelers (Bureau of Transport and communications Economics, 1994). According to Butler and Keller (1992), only the customer can truly define service quality in the airline industry. Some argue that quality in the airline industry is difficult to describe and measure due to its heterogeneity, intangibility and inseparability.

Most of the work done on service quality has assumed the attributes of service quality are independent. However, intuitively it would seem that many of attributes have some degree of inter-dependence which is not properly evaluated using conventional additive measures.

This study aims to evaluate the service quality of an airline using a mathematical modeling approach. Service quality is a composite of different attributes; among them many intangible attributes are difficult to measure. Factor analysis is initially used to extract some independent common factors and fuzzy measures were calculated to evaluate the performance of inter-dependent attributes in each common factor. The study also examines the positioning of the airline relative to three other airlines. A pair-wise comparison approach was adopted to determine the relative weights between each factor to position the three airlines. The result suggests that other than a few service attributes like In-flight entertainment and seating comfort, passengers are satisfied with most of the attributes.

Methodology

Sample & Survey: After deciding on suitable attributes for measuring airline service quality, we designed a questionnaire to be distributed between the passengers in Bandaranayke International airport where respondents had to rate the perceived quality of each attribute on a 5 point Likert scale with anchors of "Excellent" to "Very Bad". Chosen control variables were gender, nationality, age category and the level of experience. Data were obtained based on an airline operating in BIA which is coded as Airline A. Separate part was included to measure the relative performance of Airline A with compared to three other airlines using a 5-point scale with anchors of "Far better than A" to "Far lesser than A".

The λ fuzzy measure; Fuzzy measure is used to measure the membership degree of an attribute towards one common factor. Interdependencies are addressed by the fuzzy measures (Figure 1)

Mean values of satisfaction was used to measure the perceived level of satisfaction.

Pair wise comparison approach was used in deriving the relative weights between considered 5 areas in measuring the relative performance of Airline A with three other airlines.

Results

Combination of assessment value for comparison of airline is presented in Table 1.

Table1: Combining assessment value for comparison of airline

Airline	Hospitality W1=0.05	Cabin Crew W2=0.1	Food W3=0.1	Safety W4=0.3	value W4=0.45	WAV
Airline B	2.660	2.691	2.747	2.716	2.947	2.818
Airline C	2.943	2.887	2.887	3.038	3.038	3.003
Airline D	2.605	2.687	2.565	2.643	2.842	2.727

Principal component analysis factor loadings were used to extract the independent common factors and considered 22 attributes (C1-C22) were divided into 5 common factors. (Figure 1)

Figure 1: Fuzzy measure $g(\cdot)$

1. Cabin Staff service ($\lambda = -0.96$)
C1=0.32, C2=0.24, C3=0.55, C4=0.41, C5=0.30, (C1, C2, C3, C4, C5) = 1
2. On-board product ($\lambda = -0.84$)
C6=0.52, C7=0.38, C8=0.34, C9=0.36, C10=0.14, C11=0.12, C12=0.30, C13=0.35
(C6, C7, C8, C9, C10, C11, C12, C13) = 1
3. Facilities for kids ($\lambda = -0.71$)
C14=0.45, C15=0.4, C16=0.7, (C14, C15, C16) = 1
4. Service quality ($\lambda = 0.36$)
C17=0.31, C18=0.62, (C17, C18) = 1
5. Information System ($\lambda = -0.64$)
C19=0.35, C20=0.4, C21=0.56, C22=0.25, (C19, C20, C21, C22) = 1

Discussion

Table 1 shows the relative weights of the five elements of service quality to evaluate the relative performance of Airline A with the other three airlines. Value for money contributes for 45% of service quality with safety also playing an important role. This reflects that most of the passengers are concerned about the service they receive for the money paid and also the safety record of the airline. In contrast, hospitality seems to have little attraction to passengers which only accounts for 0.05 of the total weight. Other than safety and value for money all three airlines are ranked above Airline A in the other three aspects (Table1) Airline A shows better results in safety and value for money in comparison with Airline C and ranked below the other two airlines in all aspects. However, the weighted average values show that Airline A has a better value than Airline C but not as good as Airline B and Airline D. Here it should be noted that Airline C is an Indian based budget airline. Passengers who have also traveled in Airline C are more likely to be Indians.

European and Asian passengers were accounted for nearly 70% of the total sample and Middle Eastern and African passengers were hardly found, hence excluded from the sample. The responses made by economic class passenger were chosen for the analysis as

only a few business class passengers were contacted. A percentage of 61% represents the age category of 25-44 and only 7.5% of the total sample was below 25 years. The fact that 40% of total respondents have travelled with more than 10 airlines has made the sample more reliable.

Cabin staff service shows impressive results where all the attributes are perceived above "Good" level of satisfaction. However, service efficiency was the least satisfied attribute (mean value of 1.99) and at the same time it's the highest impact towards the cabin staff service (fuzzy measure of 0.55).

In overall, onboard products have much lower satisfaction levels relevant to cabin staff service. Though shorter seat pitch can increase the capacity of each flight, it degrades the onboard services drastically. Music and videos (C12) is the most dissatisfied attribute in onboard product (2.72) and the age group of 15-25 has rated it well below the 'satisfactory' level'. That is an indication that young passengers have more expectations on music and new videos. Choice of food and beverage and the quality of food are slightly above the average level of satisfaction (2.34,2.32 respectively) and also have a collective fuzzy measure of 0.62.

Punctuality (C18) is the most important attribute in the category of service quality which has a greater fuzzy measure (0.52) but was largely criticized by some of the passengers stating that they will never fly through Airline A again because of this particular problem. Though some passengers got problems with punctuality in overall it has a mean satisfaction 2.02 indicating more passengers are happy with on time performance.

Overall passengers have ranked Airline A as 'Good' in the 5 point Likert scale with a mean value of 2.01. The ranking as perceived by customers seem to be largely independent of gender, age, nationality and with experience of having traveled in other airlines. The fact that overall rating seems to be independent of the number of other airlines customers have traveled, is an important fact as it shows traveling in other airlines hardly affects the way customers perceive Airline A.

Conclusions

Cabin staff service is a key strength of Airline A. Onboard products are a somewhat cause for concern where improvements should be made on music and videos and seating comfort attributes where seating comfort is the most important attribute of onboard product. Though music and videos has a lower importance towards the onboard product, for young passengers sometimes it is more important than other attributes. Facilities for kids are impressive and more focus is required for the food provided to children. Smoothness in takeoff and landing is appreciated but punctuality was criticized by some passengers. Effectively communicate the reasons for delay and providing some facilities for them are the recommended actions for the punctuality problem.

The overall rank of the Airline A with other three airlines is as follows.

Airline B>Airline D> Airline A>Airline C. Here, Airline B and Airline D are ahead of Airline A in all five aspects and not surprisingly they are 5-star airlines. However, Airline A is in a better position in the aspect of value for money and it is better than Airline C and much closer to become equal with Airline D.

References

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