



## **Evaluation of Service Quality in Airlines By Entropy and ARAS Methods**

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### **Extensive Summary**

#### **1. Introduction**

Today, especially with the liberalization and commercialization process, the air transport sector has shown an important development. However, it is predicted that passenger demand for the airline will continue to increase in the coming years (Boeing, 2016). At first, air transportation was considered as a very expensive means of transportation, but nowadays, as a result of various regulations (such as Airline Deregulation Act in 1978) and technological developments, prices have begun to fall and the demand for airline has begun to increase. While the increase in demand for airline caused bigger competition, airline operators needed a more reasonable and beneficial element to compete and differentiate because price was a risky competitive tool.

As the services begin to take place in our everyday lives, and thus the service sector grows significantly, there is also a question about the quality of services that are valid for physical goods, and businesses needed to improve service quality. The most important reason is that service quality has a positive effect on some variables such as customer satisfaction, customer loyalty and long-term financial performance. Service quality is defined as a general judgment that consumers perceive about the excellence of a service and many models have been proposed in the literature notably SERVQUAL (Parasuraman, Zeithaml and Berry, 1988) for measuring and improving the quality of service.

Today, like all service sectors, the quality of service in the air transport sector is essential and is always being tried to be improved. Airline operators today regard service quality as an important tool of competition. In order to improve service quality, airlines are taking advantage of technological opportunities at a high level and are taking many steps to meet customer expectations, including participating in global alliances.

Nevertheless, it is still a question of how successful the quality development efforts of airline companies are and how consumers perceive these services in terms of performance.

## 2. Purpose and Scope

The aim of this study is to examine the performance of service quality in airline operators through the example of the major airlines in the world. In this context, eleven airlines, which have carried the highest number of passengers in the world in 2016, have been evaluated and ranked in terms of service quality performance. This work, which uses secondary data, is based on Skytrax data, which has been awarded aviation awards since 2001 and has a great prestige in the industry. Skytrax allows passengers to evaluate airline operators and airports on the basis of a variety of criteria. In this study, the evaluations of the passengers on the airlines - specifically the business class services - were taken into account.

## 3. Methods

In this study, which deals with quality of service in airline companies, the question of which airline has the best quality performance among the leading airlines of the world was considered as a problem of decision making. Accordingly, it was thought that it would be more appropriate to use multi-criteria decision making methods in the study. Entropy and ARAS methods were used as integrated in this study where 11 airline companies were evaluated according to factors including pre-flight services and in-flight services. In the first stage, the Entropy method, one of the objective weighting methods (Shemshadi vd., 2011: 2161), was used to obtain the importance levels of evaluation criteria. In the second stage, the application of the ARAS method was carried out using the "Entropy weight values" as input. As a result of the application, the determination of the nearest airline operation has been provided to the optimal value in terms of service quality. As a result of the application, it is aimed to determine the airline operation which is the best in terms of service quality.

## 4. Findings

In the study, the entropy method was applied first. In the Entropy method, in which the solution process consists of 5 steps (Ömürbek ve Aksoy, 2016), the decision matrix was created with the help of scores according to 7 evaluation criteria of 11 airline operators. The weight values obtained in the last step of the application and showing the importance levels of the criteria are shown in Table 1.

**Table 1. Significance Levels of Evaluation Criteria**

HL	FU	HP	UK	UI	EL	KY
0,146829	0,166067	0,111597	0,128694	0,179882	0,146586	0,120345

As shown in Table 1, calculations were made on 7 evaluation criteria. The codes include HL (airport services), FU (Lounge services-physical components), HP (Lounge services-service staff), UK (In-flight comfort), UI (In-flight refreshments), EL (Entertainment) and KY (elements for the cabin crew). When the table was examined, it was seen that the most important criterion was in-flight refreshments (0.1799) and then the physical components of lounge services came in second place (0.1661). As a result

of the implementation, the least important criterion was found to be the service staff related to lounge services.

In the next step of the study, the ARAS method was carried out and the airline companies were ranked according to the optimal alternative with the same decision matrix used in the Entropy method. In the ARAS method, which is the solution process is 4 steps, in the last step, the optimality function values and utility ratings of the alternatives are calculated. The result table of ranking is shown in Table 2.

**Tablo 2. Performance Ranking of Airline Companies**

	$S_i$	$K_i$	Ranking
$A_0$	0,099651	1,000000	optimal
Air China	0,065529	0,657578	10
Air France	0,082523	0,828118	7
ANA	0,098039	0,983820	1
British Airways	0,074720	0,749814	9
China Southern	0,084096	0,843900	5
Emirates	0,083202	0,834926	6
Hainan	0,090362	0,906781	2
LATAM	0,065519	0,657482	11
Lufthansa	0,082373	0,826610	8
Qantas	0,088098	0,884063	3
THY	0,085888	0,861889	4

As Table 2 shows, airline operators are ranked according to the optimal alternative ( $A_0$ ). As a result of the ranking, it is seen that the airlines with the best service quality according to the analysis result are ANA All Nippon, followed by Hainan, Qantas, THY and China Southern airlines respectively. On the other hand, LATAM was ranked in the last place according to the analysis.

## 5. Result

Although studies related to service quality have been conducted in the 1980s, it is known that it has started to increase since 1990s. Until now, many measurement models of service quality have been proposed and many different methods have been used in different research questions. In this study, the quality of the airline service has been handled with a different approach (Multi-Criteria Decision Making).

In conclusion, it should be noted that while the most important criterion for entropy is found to be in-flight refreshments, the method uses a density of contradictions or, in other words, a standard deviation. Hence, it is concluded that the scores given for the in-flight refreshments for each airline are more volatile than the other criteria. In the second phase of the study, the ARAS method was applied to determine the airline with the best performance. Although implementation is based on 7 criteria, it should not be forgotten that the quality of service in airline is a concept that includes many sub-processes and can not be measured with few criteria. Besides these, it is considered that the study is an important step in the quality of airline service literature in terms of sampling and methods.