Fuzzy SERVQUAL Analysis in Airline Services

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This study is aimed at measuring and summarizing the perceived and expected service quality of passengers of an international airline and to provide the passengers' opinions to the decision makers employing fuzzy logic. The appropriate fuzzification procedure was determined to be the trapezoidal membership function. Using SERVQUAL methodology, the optimal fuzzy interval of the gap scores was determined for each item. The interpretations of these fuzzy intervals were categorized into three areas - optimistic, neutral and pessimistic passenger views - to assist the decision makers in identifying which items of services are satisfactory and which are in need of improvement.

Key words: Airline service quality, fuzzy numbers, fuzzy SERVQUAL scores.

1 Introduction

Today, most airline firms have recognized the importance of service quality. As Ostrowski (1993) said, the delivery of a high quality service become a marketing requirement among air carriers and continuing to provide perceived high quality services would help airlines acquire and retain customer loyalty (Chang and Yeh, 2002). In evaluating quality, understanding the passengers' expectations and measuring the service quality they desire plays a major role. Parasuraman et al. (1985, 1988) developed SERVQUAL for measuring service quality in organizations (Cavana et al., 2007) and since then, SERVQUAL has been used as an acceptable instrument in service quality studies. However, SERVQUAL-based studies of airline service quality are limited. With this as a starting point, this study focuses on measuring airline service quality from the point of view of international passengers using the SERVQUAL model with fuzzy logic. It also demonstrates how an airline firm can utilize a diagnostic tool when managing its service quality based on passenger opinions.

SERVQUAL studies of airline service quality are commonly performed by calculating the mean averages of the passengers' gap scores. As a SERVQUAL questionnaire is built using Likert scaling, the categories are ranked in ordinal scales, which indicates that the calculation of mean scores is not an efficient method of evaluation (Pakdil and Aydin, 2007). For a ranking scale, frequencies or percentages are offered to obtain reliable conclusions. Nevertheless, if the evaluation is performed by mean averages or standard deviations, the passengers' raw scores should be transformed into quantitative interval scores. For this reason, this study offers fuzzy numbers in the measurement of service quality. Fuzzy quality is an overall comprehensive reflection of clear quality (Yongting, 1996). Yongting (1996) points out that, although fuzzy quality and clear quality are completely different, they can be transformed into each other and are also consistent with each other.

Additionally, fuzzy logic enables analysis using ill-defined sampling or where there is missing data. In survey analysis, including SERVQUAL, it is hard to achieve an optimal sample that includes equally distributed gender, nationality, marital status, educational level and so forth. Therefore, generalizing the findings of a survey is quite risky, as the applicants in the sample cannot sufficiently reflect the quality evaluations of all passengers. Furthermore, a questionnaire itself is a subjective tool and daily variables can affect the results. The passengers' perceptions can change depending on their mood during the response time - or the purpose of the flight can also affect responses while filling in the questionnaire form. Passengers leaving for a holiday would be more optimistic than those ones flying for business purposes (Pakdil and Aydin, 2007). For this reason, we propose to analyze the responses using imprecision methods. Fuzzy logic is a way to analyze when some defects exist in the data or in the sample. It allows one to obtain results for different types of customers or managers. Fuzzy logic keeps in mind that a perception of an item would be different for optimistic and pessimistic passengers. This may also be true for the quality manager of the firm. An optimistic manager would be more easily satisfied with the service quality analyses results than a pessimistic manager. Hence, while a pessimistic (risk averse) manager would improve an item, the other may not perceive a need for any improvement on the same item. For this reason, this study utilizes fuzzy logic to offer different solutions for differently characterized passengers and managers. Although there are some fuzzy related quality studies for airlines (Tsaur et al, 2002; Chang and Yeh, 2002; Wang, 2008), this study is focused on the fuzzy SERVQUAL scores of airline services. This study is an evaluation of just one specific airline firm, whereas former studies depended on ranking alternatives by analyzing three or more different firms.

2 Fuzzy Logic and Fuzzy Numbers

Fuzzy sets were introduced in 1965 by Lotfi Asker Zadeh in order to define human knowledge using mathematical expressions. When the main concern is with the meaning of information-rather than with its measurement, the proper framework for information analysis is possibilistic. Thus implying that what is needed for this analysis is not called the theory of possibility (Zadeh, 1999)**.** Since then, fuzzy sets and fuzzy logic have been widely used in cases of ill-defined or incomplete data and for expressing the satisfaction preferences of personal evaluations. Uncertainty in the model, without the importance of the reason, can be eliminated using fuzzy numbers and crisp intervals can then be provided for decision makers. Crisp intervals are called a-cut sets in fuzzy theory and they reflect the optimal decisions, depending on the risk attitude of the decision maker. Fuzzy numbers are presented with their membership functions.

DEFINITION 1. A fuzzy set $\tilde{A}$ in a universe of discourse X is characterized by a membership function $\mu_{\tilde{A}}(x)$ which associates each element x in X, with a real number within the interval of [0,1]. The definition of $\mu_{\tilde{A}}(x)$ implies that the degree of possibility may be any number in the interval of [0,1], rather than just a 0 or a 1. The function value $\mu_{\tilde{A}}(x)$ terms the grade of membership of x in $\tilde{A}$ (Zadeh, 1999; Chen, 2000).

DEFINITION 2. Let $\tilde{A}$ be a fuzzy set and $\mu_{\tilde{A}}(x)$ be the membership function for $x \in \tilde{A}$, if $\mu_{\tilde{A}}(x)$is defined as below;

$$\mu_{\tilde{A}}(x) = \begin{cases} \frac{(x-\mathrm{a})}{(\mathrm{b}-\mathrm{a})}, & \mathrm{a} \le x < \mathrm{b} \\ 1, & \mathrm{b} \le x \le \mathrm{c} \\ \frac{(\mathrm{d}-x)}{(\mathrm{d}-\mathrm{c})}, & \mathrm{c} < x \le \mathrm{d} \end{cases}$$

then x is a trapezoidal fuzzy number (Klir and Yuan, 1995). In Figure 1, the trapezoidal number x; x=(a;b;c;d) is presented. For b=c, it is a triangular fuzzy number, where the shape turns into a triangle.

DEFINITION 3. Let $\tilde{A}$ be a set of fuzzy numbers. $\tilde{A}_\alpha = \{x \mid \mu_{\tilde{A}}(x)\ \alpha \text{ and } x \in X\}$ is called an a-cut set for $\tilde{A}$. In Figure 1, $[x_{\alpha 1}, x_{\alpha 2}]$ presents an a-cut set for $\tilde{A}$.

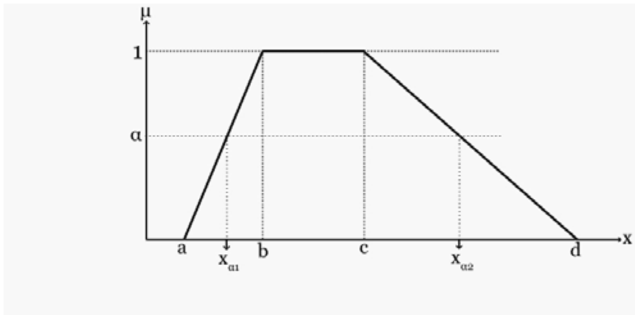

Figure 1: Trapezoidal fuzzy number.

Figure 1 can be read as; when x is in the [b,c] interval, it belongs to $\tilde{A}$ with a possibility of 1. When x decreases form "b", the degree of belonging is calculated by the $\mu_{\tilde{A}}(x)$ function. Obviously, for x ≤ a, the belonging is zero. Note that a is the lower limit of set $\tilde{A}$. Similarly, when x increases towards d, the membership function approaches zero. As shown in Figure 1, $\tilde{A}_\alpha$ (an α-cut interval) is a crisp set.

DEFINITION 4. Assume that T and Y are fuzzy numbers and their a-cuts are $[t_{\alpha 1}, t_{\alpha 2}]$ and $[y_{\alpha 1}, y_{\alpha 2}]$. Subtraction of the fuzzy numbers T and Y, denoted as Z, is also a fuzzy number and it is calculated using the α-cuts. The subtraction is defined as;

$$Z_\alpha = [\min(t_{\alpha 1} - y_{\alpha 1}, t_{\alpha 2} - y_{\alpha 2}), \max(t_{\alpha 1} - y_{\alpha 1}, t_{\alpha 2} - y_{\alpha 2})]$$

for every α-cut (Lai and Hwanh, 1992).

3 Fuzzy Quality and Measuring Airline Services with Fuzzy SERVQUAL

Fuzzy logic was first used in quality evaluation by Yongting (1996), in analyzing the process capability index. He studied the basic structure of quality in production processes and focused on a “suitable quality” concept rather than deterministic, crisp (non-fuzzy) quality. The study was a pioneer for later fuzzy quality research in production and services. Chien and Tsai (2000) studied fuzzy service quality and proposed a new methodology for evaluating perceptions in the retail industry. They used triangular fuzzy numbers and Hamming distance to overcome the subjective responses to SERVQUAL questions.

In airline services, quality evaluations differ from other sectors. In the airline industry, only the passengers can truly define the service quality (Chang and Yeh, 2002). However, while the service quality is measured via survey, the responses depend on the customers’ own observations and thus the responses change depending on personal opinions. In airline services especially, passengers evaluate the perceived services in a limited time frame - before leaving the plane. Additionally, in some surveys, frequency of flying, nationality, educational level or the gender of the respondents may not be uniform. Moreover, some of these respondents may be first-time fliers, who may not be sure of their expectations or their satisfaction with their first flight. From these starting points, Chang and Yeh (2002) first performed the most significant application of fuzzy survey analysis on airline services. They used triangular fuzzy numbers in defining the evaluations and proposed ranking of airline alternatives among four firms, depending on their performance index. In this study, the nationalities, gender and educational levels of the respondents are distributed unequally, which is the main reason for analyzing the responses using fuzzy logic.

Table 1: Service quality dimensions of the SERVQUAL items

# of Item	Service Quality Dimensions
1	On-time departure and arrival
2	Consistent ground/in-flight services
3	Performing the services right the first time
4	Quality of the food and beverage
5	The behaviour of employees inspires confidence
6	Safety
7	Employees have the knowledge to answer my questions
8	Clean and comfortable interior/seat
9	In-flight entertainment facilities and programs
10	In-flight newspaper, book, etc. facilities
11	The availability of waiting lounges
12	In-flight internet/email/fax/phone facilities
13	Courteous employees
14	Neat and tidy employees
15	Non-stop flights to various destinations
16	Convenient flight schedules and enough frequencies
17	Flight problems (cancellations, delays, deviations from schedules)
18	The availability of global alliance partners’ network
19	Understanding passengers’ specific needs
20	Individual attention to passengers
21	The availability of a frequent flyer program
22	The availability of air/accommodation packages
23	The availability of travel related partners (e.g. hotels, car, rentals)
24	Efficient check–in/baggage handling services
25	Employees are always willing to help
26	Employees handle requests/complaints promptly
27	Handling of delayed/lost/damaged/overweight baggage
28	Employees’ foreign language level
29	Employees’ approach to unexpected situations
30	The quality of the reservation services
31	Handling fare problems
32	The advertising of the airline company
33	Employees’ behaviour to delayed passengers
34	The external appearance of the airplane
	The image of the airline company

Hence, fuzzy logic allows the removal of subjective judgments.

Tsaur et al (2002) worked on ranking three different airline firms and used triangular fuzzy numbers in multi-criteria analyses. The study used an Analytical Hierarchical Process (AHP) to determine the criteria weights, then measured the overall performances of the airlines in terms of fuzzy numbers. Finally, it ranked the firms according to their similarities to ideal solutions.

A few of the previous airline service quality studies analyzed performance with fuzzy logic. They all utilized triangular fuzzy numbers. Triangular fuzzy numbers are more definite than trapezoidal fuzzy numbers for determining the optimal decision. Triangular numbers give the optimal membership (belonging) degree with a single value, where trapezoidal structures extend this single number to an interval. In this study, we examined trapezoidal fuzzy numbers in order to offer different optimal solution intervals depending on the risk taking attitude of the decision maker. This facilitates the decision processes and leads to more realistic solutions.

3.1 Application

In order to measure the service quality of the airline, a questionnaire was designed based on a 5-point Likert sca-

Table 2: Demographic statistics.

Variable		**%**
Gender	Male	69.1
	Female	30.9
Age	Less than 21	3.0
	21-30	24.8
	31-40	28.2
	41-50	23.8
	51-60	13.8
	61 or older	6.4
Nationality	Western European	5.0
	Eastern European	1.3
	Japanese	1.7
	Indian	0.9
	Turkish	84.6
	United States	6.5
Education	Elementary school	10.4
	High school	21.1
	University	68.5
Marital status	Married	71.8
	Single	28.2
Average use of airline	More than once a week	3.4
	Once a week	6.4
	Once a month	39.6
	Once a year	17.8
	Less than once a year	31.5
Purpose of last trip	Business	27.6
	Holiday	18.1
	Business and holiday	39.9
	Other	14.4
Frequently used airlines	United States-based	5.4
	European-based	73.2
	Asian-based	2.4
Who helps selecting airline	Family	10.4
	Friends	2.7
	Myself	59.4
	Travel agency	21.1
	Other	6.4
The most important reason for choosing the airline	Price	25.2
	Past experience	56.0
	Advertisements	4.0
	Recommendation	6.7
	Other	8.1

le. The first part of the questionnaire contained control variables such as gender, age, nationality, education level, job position and so forth. The second and the third parts included 35 service quality items (Table 1), measuring the passengers' expectations and perceptions. Then, the questionnaire was examined by airline firm experts and their contributions were incorporated into the questionnaire. Next, the questionnaire was pre-tested by 18 academic staff from XXX University, who had flown at least once, to test how comprehensible the questionnaire was and how easy it was to respond to. Finally, some minor changes were made to the questionnaire form and the content validity of the questionnaire was deemed adequate. Cronbach's alphas were calculated to test reliability and were found to be .89 for both parts.

In applying the questionnaire, firstly a sample size was determined. Based on DeVaus (2000), with a 95% confidence level and a 5% error margin, the sample size was calculated as 385. The sample consisted of passengers on an international airline firm that flies from Ataturk International Airport, Istanbul, to various destinations. The questionnaires were distributed accompanied by a covering letter explaining the objective of the survey and assuring the confidentiality of all respondents. A total of 1000 questionnaires were distributed to the sample and the response rate was 32%. However, a small amount of filled questionnaires were not sufficient to be analyzed. Therefore the actual response rate turned out to be 29.8%. The survey was applied for over two weeks and was performed on three different routes based on cluster sampling. The airline firm preferred to conduct the survey on board, in the last hour of the flight. Participation was voluntary.

In this study, the survey was conducted on 298 passengers. The passengers were categorized as follows; male (69.1%), Turkish (84.6%), married (71.8%) and has at least a graduate degree (68.5%). The other demographic statistics are presented in Table 2.

Firstly, both the perceptions and the expectations of 298 respondents are converted to fuzzy numbers. Evaluations defined using a 5-point Likert type scale of linguistic expressions, are converted to trapezoidal fuzzy numbers. In the expectation section, the scale is presented as {Unimportant, of Little Importance, Moderately Important, Important and Very Important}, while it is {Strongly Disagree, Disagree, Undecided, Agree and Strongly Agree} in the perception part. The scale defined the fuzzy numbers as; Unimportant/ Strongly Disagree = (0, 0, 0, 0); of Little Importance/ Disagree = (0, 0.11, 0.19, 0.42); Moderately Important/ Undecided = (0.32, 0.41, 0.58, 0.65); Important/ Agree = (0.58, 0.80, 0.90, 1) and Very Important/ Strongly Agree = (1, 1, 1, 1). These transformations are based on Tsai and Lu's (2006) study, where a 9-point Likert scale was used. As a 5-point Likert scale was used in this study, Tsai and Lu (2006)'s relations between fuzzy numbers and evaluations were adapted using fuzzy arithmetic. Leaving the first, last and medium linguistic terms as the same, the ones between them are redefined using the fuzzy arithmetical means. In Figure 2, graphical representations of the fuzzy evaluations are given.

In Figure 2, an "Unimportant" evaluation implies that the expectation of the item is marked as 1 in the original questionnaire and presented as (0, 0, 0, 0), in terms of a fuzzy number. Similarly, the presentation is same if the perceived item is "Strongly Disagree", where it is also defined as (0, 0, 0, 0) as a fuzzy number. When the expectation is "of Little Importance" or the perception is "Disagree", the figure marks the evaluations as (0, 0.11, 0.19, 0.42). The rest of the evaluations for both expectations and perceptions are drawn in a similar way. Additionally, note that "Disagree" is a better evaluation than "Strongly Disagree". Considering these two evaluations, "Strongly Disagree" is indicated with a higher fuzzy number than "Disagree". Although the first components of these num-

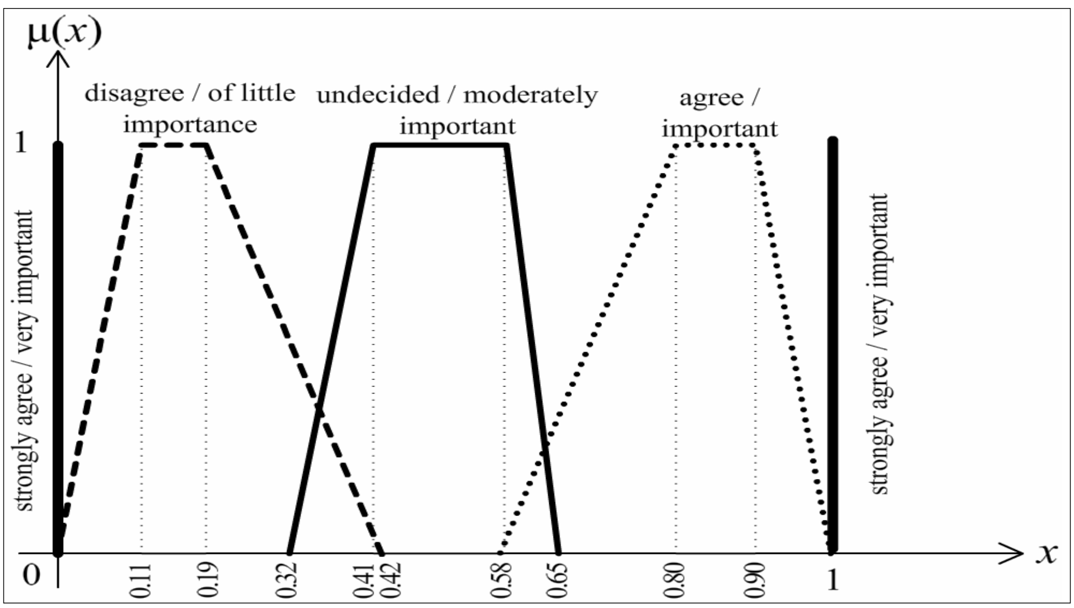

Figure 2: Evaluations of the items, in terms of fuzzy numbers.

bers are “0”, the next ones show the superiority of “Disagree” against “Strongly Disagree”.

After determining the fuzzy expressions, the SERVQUAL scores of every passenger for 35 items are defined using fuzzy numbers. The mean values of the fuzzy numbers are advisable expressions in personal evaluations while studying with fuzzy numbers (Tsai and Lu, 2006). For this reason, the mean values of each item are calculated based on 298 respondent evaluations as provided in Definition 4. It is obvious that the means are also fuzzy numbers. As the evaluations are defined using trapezoidal fuzzy numbers, the means are also calculated as trapezoidal fuzzy numbers. Next, because the manager addresses customer satisfaction; the limits are calculated for various α-cuts, which imply the risk attitudes, and the results are presented in Table 3.

In Table 3, most of the gaps are negative values, which show that the passengers are generally unsatisfied with their services. In this case, the manager received unsatisfactory results on most of the items.

The table should be read according to the risk attitude of the decision makers (passengers or managers). For a risk averse, pessimistic decision maker, the α-cut is 1 and for the first item, the result indicates that the gap score should be kept in the interval of [-0.321, -0.239] in order to satisfy the pessimistic decision maker. However, because the interval is negative, the manager perceives an unsatisfied result for the first item. If the decision maker is a little bit risk taking, s/he should look at the 0.75 valued α-cut. The rest of the table can be interpreted similarly. For a risk taking, optimistic decision maker, the α-cut is 0, and the optimal gap score interval is calculated as [-0.425, -0.135] for the first item. Conversely, looking at the last

Table 3: Lower and upper gap limits for some α-cuts.

	α-cuts									
	α = 0.00		**α = 0.25**		**α = 0.50**		**α = 0.75**		**α = 1.00**	
item	**lower**	**upper**	**lower**	**upper**	**lower**	**upper**	**lower**	**upper**	**lower**	**upper**
1	-0.425	-0.135	-0.399	-0.161	-0.373	-0.187	-0.347	-0.213	-0.321	-0.239
2	-0.271	0.079	-0.238	0.049	-0.205	0.018	-0.171	-0.013	-0.138	-0.043
3	-0.215	0.102	-0.182	0.071	-0.150	0.040	-0.118	0.009	-0.085	-0.022
4	-0.317	0.127	-0.281	0.090	-0.245	0.054	-0.208	0.017	-0.172	-0.019
5	-0.229	0.104	-0.198	0.078	-0.167	0.053	-0.136	0.027	-0.106	0.001
6	-0.171	0.015	-0.147	0.000	-0.123	-0.016	-0.098	-0.031	-0.074	-0.046
7	-0.190	0.149	-0.160	0.120	-0.129	0.092	-0.099	0.063	-0.069	0.034
8	-0.023	0.081	0.009	0.052	0.042	0.023	0.074	-0.006	0.106	-0.035
9	-0.309	0.224	-0.267	0.185	-0.224	0.145	-0.182	0.106	-0.140	0.067
10	-0.388	0.163	-0.350	0.124	-0.312	0.085	-0.274	0.046	-0.236	0.007
11	-0.194	0.098	-0.156	0.058	-0.117	0.018	-0.078	-0.022	-0.040	-0.062
12	-0.550	0.016	-0.518	-0.016	-0.487	-0.049	-0.456	-0.081	-0.424	-0.114
13	-0.213	0.098	-0.182	0.071	-0.151	0.045	-0.121	0.018	-0.090	-0.008
14	-0.126	0.130	-0.100	0.107	-0.074	0.085	-0.048	0.062	-0.022	0.040
15	-0.243	0.101	-0.214	0.071	-0.184	0.041	-0.155	0.011	-0.125	-0.020
16	-0.320	0.080	-0.284	0.043	-0.248	0.007	-0.213	-0.029	-0.177	-0.066
17	-0.309	-0.094	-0.283	-0.122	-0.257	-0.149	-0.231	-0.176	-0.205	-0.203
18	-0.227	0.211	-0.194	0.178	-0.161	0.144	-0.128	0.111	-0.095	0.078
19	-0.123	0.163	-0.087	0.128	-0.052	0.094	-0.016	0.059	0.019	0.024
20	-0.183	0.272	-0.143	0.234	-0.104	0.195	-0.065	0.156	-0.025	0.117
21	-0.286	0.188	-0.247	0.151	-0.208	0.114	-0.169	0.076	-0.130	0.039
22	-0.150	0.164	-0.112	0.127	-0.074	0.090	-0.037	0.052	0.001	0.015
23	-0.291	0.303	-0.252	0.268	-0.213	0.232	-0.174	0.196	-0.135	0.161
24	-0.291	0.006	-0.260	-0.024	-0.228	-0.054	-0.196	-0.084	-0.165	-0.115
25	-0.264	0.176	-0.228	0.140	-0.191	0.104	-0.154	0.068	-0.117	0.032
26	-0.264	0.122	-0.230	0.090	-0.197	0.057	-0.163	0.025	-0.130	-0.007
27	-0.214	0.045	-0.182	0.019	-0.149	-0.006	-0.117	-0.032	-0.084	-0.058
28	-0.229	0.205	-0.194	0.174	-0.158	0.144	-0.123	0.113	-0.087	0.082
29	-0.258	0.105	-0.222	0.073	-0.186	0.041	-0.150	0.009	-0.114	-0.023
30	-0.245	0.102	-0.211	0.070	-0.177	0.038	-0.143	0.006	-0.108	-0.026
31	-0.169	0.114	-0.133	0.079	-0.097	0.044	-0.062	0.008	-0.026	-0.027
32	-0.305	0.250	-0.262	0.209	-0.219	0.169	-0.176	0.129	-0.133	0.088
33	-0.139	0.186	-0.102	0.152	-0.064	0.118	-0.027	0.085	0.011	0.051
34	-0.239	0.283	-0.199	0.247	-0.159	0.211	-0.119	0.175	-0.079	0.139
35	0.757	0.114	0.786	0.089	0.816	0.063	0.845	0.037	0.874	0.012

item, the positive intervals show that, independent of the risk attitude of the decision maker, the passengers are satisfied with the services of the airline. Although s/he is optimistic, the gap should be kept within the [0.757, 0.114] interval. If s/he is pessimistic, the difference between perception and expectation should be within [0.874, 0.012].

If the calculated gap score for an item is outside these intervals, two different interpretations can be made depending on the sign of the interval. Assume that the limits are negative, which then means that the manager does not expect to satisfy the passenger on that item. However, if a passenger's gap is below the lower limit of the interval, the passenger perceives the service quality as worse than the manager's expectations. Conversely, if the gap is higher than the upper limit of the interval, the passenger is still unsatisfied with the service, but the result is better than the manager's venture. Note that the manager had already ventured this satisfaction in all levels. Then the result suggests an improvement on that item.

If the interval is positive, it shows that the related item is expected to satisfy the decision maker. Although the decision makers' goal is to preserve the gaps within the given intervals, for positive gaps, passenger satisfaction is lower than desired level if the achieved gap is less than the lower limit. This also calls for an improvement in that item. Conversely, if a gap passes over the positive upper limit, it shows that the satisfaction is higher than the aimed satisfaction level. A high positive gap score implies that the perceived service is higher than the manager's estimates/ hopes/ expectations. In this study, the results show that the passengers are unsatisfied with the airline in most of the items, but are satisfied with the image of the airline which is the last item.

4 Conclusion

In the competitive airline industry, as in all service-providing institutions, the service quality must be measured using all the aspects of the service provided. In airlines, it is obvious that the most acceptable evaluations can only be done by passengers who have flown the airline at least once.

Questionnaires are the most applicable tools for investigating the passengers' views. SERVQUAL is widely used both for collecting data and understanding the passengers' thoughts. SERVQUAL is a Likert scale based linguistic questionnaire, where calculating the arithmetic means of responses is not meaningful. By using the fuzzy approach, more expressive results can be achieved not just in case of linguistic data, but to cover loss of data. In order to avoid misleading results and their interpretations, fuzzy logic is used in this study.

Although the optimal sample size was determined at the beginning of this research, it turned out to be an inconvenient sampling procedure in the data collection stage. The demographics showed that there were inequalities in some of the basic features of the respondents, such as nationality, gender, marital status and educational level. For this reason, the results of the evaluations of passengers cannot be generalized. This led us to analyze the SERVQUAL scores using fuzzy numbers. After transforming the raw scores into trapezoidal fuzzy numbers, gap scores are calculated using fuzzy arithmetic and α-cuts are used to calculate the optimal decision intervals for the different types of decision makers. This would allow quality managers to evaluate their services from the viewpoints of the optimistic, pessimistic or regular passenger.

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Mehka SERVQUAL analiza letalskih storitev

Cilj te študije je merjenje in analiziranje dosežene in pričakovane kakovosti potniških storitev mednarodne letalske družbe in posredovanje mnenj potnikov s pomočjo mehke logike tistim, ki sprejemajo odločitve. Za mehko proceduro je bila kot primerna sprejeta trapezoidna članska funkcija. Z uporabo servqual metodologije je bil za vsako postavko določen optimalen mehki interval razpona zadetkov. Interpretacije teh mehkih intervalov so bile razporejene v tri področja – optimistična, nevtralna in pesimistična mnenja potnikov – s čimer naj bi pomagali tistim, ki sprejemajo odločitve, pri določanju tega, katere storitve so zadovoljive in katere potrebujejo izboljšave.

Ključne besede: kakovost letalskih storitev, mehke vrednosti, mehki SERVQUAL zadetki