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Measuring service quality and a comparative analysis in the passenger carriage of airline industry

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Abstract

Acquiring new customers and retaining existing customers have long been two important subjects for service organizations. Creating difference in every section of the service is a key factor to success on realization of these purposes. When service quality is thought as an important factor for creating difference in service industry, the importance of estimating service quality provided to customers comes out. Estimating service quality is a hard issue for service firms because services are intangible, heterogeneous, perishable, and inseparable. Estimating service quality provides service firms how to manage their marketing operations appropriately. Therefore, this estimation should be performed with right measurement scales. In this study, first, service marketing literature was reviewed and then data were gathered via questionnaire forms. Lastly exploratory factor analysis was conducted and two scales which estimate service quality were compared in the research. The findings reveal that the weighted Servperf scale has explained perceived service quality more much than the weighted Servqual scale did in the research.

Keywords: Creating difference, service quality, estimating service quality, exploratory factor analysis, Servperf scale, Servqual scale.

1. Introduction

With the effect of globalization, marketplaces have been closer to each other providing consumers to have lots of information about all products and services. This situation has brought out high competition level in service industry like other industries have had.

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Acquiring new customers and retaining existing customers have long been two important subjects for service organizations. Creating difference in every section of the service is a key factor to success on realization of these purposes. When service quality is thought as a great factor on creating difference in service industry, the importance of estimating service quality provided to customers comes out. Estimating service quality is a hard issue for service firms because services are intangible, heterogeneous, perishable, and inseparable. Estimating service quality provides service firms how to manage their marketing operations correctly. Therefore, this estimation should be done with right measurement scale.

The main purpose of this study is to provide some information about the differences between two different service quality scales with findings from Turkish application in airline industry and to discuss comparative results which are debated issues in the service quality literature. One of the two widely used models has been SERVQUAL model that is based on difference between expectation and performance, and the other model SERVPERF that is based on only service company's performance.

First, conceptualization of service quality, SERVQUAL scale, criticisms about SERVQUAL scale, and SERVPERF scale were examined and then the findings of an application in the passenger carriage of airline industry were discussed in this research.

In the research, data were gathered via the questionnaire forms used in face- to- face interviews with 1100 passengers in Istanbul Ataturk Airport and Sabiha Gokcen International Airport. Exploratory factor analysis was held in SPSS XVII program. The results implied that weighted SERVQUAL scale exhibited five dimensions which are consistent with the theory. Also SERVPERF scale did not demonstrated unidimensional structure which was defended by scale creators. As an outcome of the survey, estimating service quality with weighted SERVPERF scale will be a more precious way in the passenger carriage of airline industry.

2. Literature Review

2.1. Service Quality

There is no consensus on definition of quality. According to [9] quality is zero defect -doing it right first time. Quality means meeting the requirements of customer. All service should be aimed at meeting the customer's requirements by eliminating non quality traits [16]. [14] unambiguously support the notion that service quality, as perceived by consumers, stems from a comparison of what they feel service firms should offer (i.e., from their expectations) with their perceptions of the performance of firms providing the services. Service quality from the provider's perspective means the degree to which the service's features conform to the organization's specifications and requirements. From customers perspective, service quality means how well the service meets or exceeds expectations [11].

[14] refer 10 service quality determinants which are used by customers in assessing the service quality. These are reliability, responsiveness, competence, access, courtesy, communication, credibility, security, understanding/knowing the customer and tangibles. Also [12] asserts that service quality has six determinants. These are professionalism and skills, attitudes and behavior, accessibility and flexibility, reliability and trustworthiness, recovery, reputation and credibility. After that, Bitner has added concept of servicescape into determinants of service quality. Because services typically require direct human contact, customers and employees interact with each other within the organization's physical facility. Ideally, therefore, the organization's environment should support the needs and preferences of both service employees and customers simultaneously [3].

2.2. Servqual Scale

Learning Servqual scale bases on gap model which proposed by Parasuraman, Zeithaml, and Berry. The gap model maintains that satisfaction is related to the size and direction of disconfirmation of a person's experience vis-à-vis his/her initial expectations. Perceived service quality is further posited to exist along a continuum ranging from ideal quality to totally unacceptable quality, with some point along the continuum representing satisfactory quality [14]. According to [22], there have been three service levels. First of them is desired service level which is defined as the level of service the customer hopes to receive. Second of them is called as adequate service level which is lower level of expectation than the other, the level of service the customer will accept. Last level is a gap. Because services are heterogeneous, the extent to which customers recognize and are willing to accept heterogeneity we call the zone of tolerance.

As a measurement tool, Parasuraman, Zeithaml, and Berry have identified 10 service quality dimensions. Servqual scale has consisted of 97 items describing 10 dimensions. Each item has assessed customer's expectations and service firm's performance. For each item a difference score Q (representing perceived quality along that item) has been defined as $Q = P - E$, where P and E are the ratings on the corresponding perception and expectation statements, respectively. Coefficient alpha and item-to-total correlations for each dimension have been computed. Items whose item-to-total correlations were low and those whose removal increased coefficient alpha have been deleted. Factor analysis has been applied to verify the dimensionality of the overall scale. Items have been reassigned and dimensions of scale have been restructured when necessary. Upon the analysis, the scale has been reduced to 35 items and 7 dimensions. As a result of last purification, the scale has been designed as 22 items and 5 dimensions. These dimensions are tangibles, reliability, responsiveness, assurance and empathy. Most factors involve communication and control process implemented in service organizations to manage employees and consequences of these processes, such as role clarity and role conflict of contact personnel. Within this perspective the model has been extended [21]. Later, Servqual measurement scale has been revised [13] by replacing "should" word by "would" and in 1994 by reducing the total number of items to 21, but five dimensional structure remaining the same [17].

2.3. Criticisms about Servqual Scale

We find useful to give some criticisms about Servqual in this section. According to [7] Servqual conceptualization is in fact flawed because it is based on a satisfaction paradigm rather than an attitude model. Also they alleged that expectancy-disconfirmation judgments however, are distinct from both consumer satisfaction judgments and service quality perceptions, involve calculated [8]. In relation to the gaps of Servqual, the expectation section is not useful. The dominant component in difference scores is clearly the perceptions scores [1]. Also Teas has investigated the same subject. There were same scores of different processes ($1 - 1 = 0$, $2 - 2 = 0$, $3 - 3 = 0$ etc.). He has questioned whether this scores have same meanings or not [19]. Another criticism is that Servqual fails to capture the dynamics of changing expectations. An expectation score in a particular year may not mean the same thing as expectation score which is taken the year after one [5]. [10] has pointed out that Servqual includes only certain aspects of service quality, and that it fails to capture other potentially less controllable components of service provision. There was another criticism about dimensionality. Servqual scale has different number of dimensions in some service industries. The Scale was appropriate for utility services [1]. Parallel with it, [6] has suggested that Servqual dimensions are not generic. The scales should be refined by factor analysis and reliability tests before commercial application. Servqual involves the calculation of the difference between expectations and perceptions. Although Servqual had high reliability, its reliability was below that of a non-difference score measure of service quality. Moreover, not only did Servqual fail

to achieve discriminant validity from its components, but the perceptions component by itself performed as well as the difference score on a number of criteria [4].

2.4. Servperf Scale

Servperf scale has come out as an opposite of Servqual scale. According to Servperf model, service marketing literature clearly supports the performance-only (Servperf) approach. Also Servperf scale explains more of variations in service quality than does Servqual. Furthermore literature review and the analysis of the structural models suggest that Servqual conceptualization is in fact flawed: it is based on a satisfaction paradigm rather that an attitude model. The performance-based developed (Servperf) is efficient in comparison with the Servqual scale; it reduces by 50% the number of items that must be measured. The analysis of the structural models also supports the theoretical superiority of Servperf scales [7]. In the paper which assessed Servperf empirically it was alleged that Servperf scale does not exhibit a five-factor structure in the research in a generalizable fashion and has unidimensional structure [18]. Servperf can provide managers with summed overall service quality score that can be plotted relative to time and specific consumer subgroups [8].

3. Methodology

3.1. Research Goal

The present study is an attempt to make a comparative assessment of the SERVQUAL and the SERVPERF scales in Turkish context in terms of their validity, ability to explain variance in the overall service quality. Data for making comparisons among the unweighted and weighted versions of the two scales were collected through a survey of the passengers of the airline companies in Turkey.

3.2. Sample and Data Collection

Using the face to face survey method, 1100 passengers of Istanbul Ataturk Airport and Sabiha Gokcen International Airport were approached. The field work was done between 24 August 2010 and 03 September 2010. After repeated follow-ups, 1080 duly filled-in questionnaires could be collected constituting a 98 per cent response rate. The sample was deliberately restricted to passengers of Istanbul Ataturk Airport and Sabiha Gokcen Airport and was equally divided between these two groups. Convenience sampling was employed for selecting respondents from these two groups. More than half of the participants were men and under the age of 35. Participants have six different occupation and income groups. 1080 surveys were processed by using factor analysis in SPSS XVII.

3.3. Measures

Parasuraman, Zeithaml and Berry's (1988) 22-item SERVQUAL instrument was employed for collecting the data regarding the respondents' expectations, perceptions, and importance weights of various service attributes. Wherever required, slight modifications in the wording of scale items were made to make the questionnaire understandable to the surveyed respondents. These items were included to assess the validity of the multi-item service quality scales used at our end.

All the scale items were obtained on a 5-point Likert scale ranging from (5) for "strongly agree" to (1) for "strongly disagree". Variables which provide a comparison of the basic variables of the scales are listed in table – I.

Table 1 Variables of and Dimensions of Servqual

Oprerationalized SERVQUAL statements		
Service quality dimensions	Variables	Statements
Tangibles	V1	Airlines have modern-looking aircraft.
	V2	The office, terminal and gate facilities of airlines are visually appealing.
	V3	Airline staff uniform appearance.
	V4	Airline's materials associated with its service are visually appealing.
Reliability	V5	When airlines promise to do something by a certain time, they do.
	V6	When a customer has a problem, an airline shows a sincere interest in solving it.
	V7	Airlines perform the service right the first time.
	V8	Airlines provide their services at the time they promise to do so.
	V9	Airline companies keep accurate records
Responsiveness	10	Airlines tell customers exactly when services will be performed.
	V11	Employees in airlines give prompt service to customers.
	V12	Employees of airlines are willing to help customers.
	V13	The airline employees are never too busy to not answer customers' requests.
Assurance	V14	Behavior of airline employees creates a sense of confidence in customers.
	V15	Customers of airlines feel safe in their transactions.
	V16	The airline employees are always respectful to customers.
	V17	Employees of airlines have the knowledge to answer customers' questions.
Empathy	V18	Airlines give customers individual attention.
	V19	Airlines have operating hours convenient to all their customers.
	V20	Airline companies have employees who give customers personal attention.
	V21	Airlines have the customer's best interests at heart.
	V22	The employees of airlines understand the specific needs of their customers.

Table 2. Results of Exploratory Factor Analysis

Unweighted SERVPERF				Unweighted SERVQUAL		
Variables	Dimensions	Factor Loadings		Variables	Dimensions	Factor Loadings
Responsiveness/Assurance (α=0.838; VE=%17.658)				Reliability/Responsiveness/Assurance (α=0.887; VE=%22.735)		
V10		0.530		V6		0.583
V11		0.590		V7		0.620
V12		0.512		V8		0.700
V13		0.515		V9		0.631
V14		0.568		V10		0.654
V15		0.664		V11		0.611
V16		0.668		V12		0.543
V17		0.566		V13		0.514
V19		0.547		V15		0.593
Reliability (α=0.790; VE=%12.708)				V16		0.525
V5	Reliability 1	0.645				
V6	Reliability 2	0.615				
V7	Reliability 3	0.750				
V8	Reliability 4	0.765				
V9	Reliability 5	0.524				
				Empathy (α=0.804; VE=%17.409)		
Empathy (α=0.781; VE=%11.825)				V17	Empathy 1	0.526
V18	Empathy 1	0.538		V18	Empathy 2	0.563
V20	Empathy 2	0.599		V20	Empathy 3	0.669
V21	Empathy 3	0.768		V21	Empathy 4	0.738
V22	Empathy 4	0.749		V22	Empathy 5	0.727
Tangibles (α=0.614; VE=%8.908)				Tangibles (α=0.682; VE=%11.937)		
V1	Tangibles 1	0.659		V1	Tangibles 1	0.645
V2	Tangibles 2	0.672		V2	Tangibles 2	0.703
V3	Tangibles 3	0.602		V3	Tangibles 3	0.602
V4	Tangibles 4	0.554		V4	Tangibles 4	0.560
N = 1080, KMO = 0.938				N = 1080, KMO = 0.959		
Bartlett's Sph X^2= 7741.276; p = 0.000				Bartlett's Sph X^2= 9972.155; p = 0.000		
Total Explained Variance = %51.099				Total Explained Variance = %52.081		

4. Findings

In this section, findings will be given about a comparative study of SERVQUAL and SERVPERF scales which have weighted and unweighted forms. Basic variables have been showed in table – I. Dimensions of scales have been evaluated in terms of Servqual's five basic dimensions. Dimensions, items of dimensions, factor loadings of items, reliability of dimensions and variances of dimensions have been located in table – II and table – III.

The report Kaiser-Meyer-Olkin (KMO) values which show the accordance of exploratory factor analysis, have appeared as 0.959 for the unweighted Servqual, as 0.907 for the weighted Servqual on the

other hand as 0.938 for the unweighted Servperf, as 0.908 for the weighted Servperf in table – II and III. When KMO takes value of 1, this indicates that these variables could predict each other perfectly [20]. Bartlett's sphericity test and p values of scales are X^2 = 9972,155 and p < 0,05 for unweighted Servqual; X^2 = 10331,295 and p < 0,05 for weighted Servqual; X^2 = 7741,276 and p < 0,05 for unweighted Servperf; X^2 = 32185,991 and p < 0,05 for weighted Servperf. If the p value is below 0,05, the relationship between the variables have proven to be sufficient to factor analysis [20].

It can be seen from table II that; the unweighted Servperf which bases only service firm's performance has four dimensions. All tangibles and reliability variables of Servqual have emerged in the unweighted Servperf. The dimensions of responsiveness and assurance have merged under a single dimension in the unweighted Servperf. The dimension of responsiveness and assurance has taken place together with V19. The unweighted Servperf has had the rates of explained variance of 17.658% for responsiveness/assurance, 12.708% for reliability, 11.825% for empathy, 8.908% for tangibles.

According to the exploratory factor analysis, the unweighted Servqual has emerged in three dimensions which are tangibles, empathy, reliability/responsiveness/assurance (Table – II). As a result of factor analysis; V5, V14 and V19 were excluded from the analysis because they have factor loadings below 0.50. There have been all tangibles items in the unweighted Servqual. V17 was accompanied by the dimension of empathy. The dimensions of reliability, responsiveness and assurance have merged under a single dimension in the unweighted Servqual. The unweighted Servqual has had the rates of explained variance of 22.735% for reliability/responsiveness/assurance, 17.409% for empathy, 11.937% for tangibles. It is possible to say that dimensions which have more variables than the others, have explained more much variance both in the unweighted Servqual and in the unweighted Servperf.

While the unweighted Servperf has explained 51.099 per cent of perceived service quality, unweighted Servqual has explained 52.081 per cent of perceived service quality.

All dimensions of the unweighted Servperf and Servqual have enough reliability values. If Cronbach's alpha **(α)** value is equal to and above 0.70, the scale is considered to be reliable. On the other hand, when the scale has less question in the dimension, the acceptable limit is 0.60 and above [20]. In this regard, sub-dimensions of both scales have reliability and it is possible to say that scales measure the desired property.

Exploratory factor analysis results can be seen in table – III. Both weighted Servperf and weighted Servqual scales have an equal number of dimensions and dimensions consisted of the same variables. These are tangibles, reliability, responsiveness, assurance and empathy. The weighted Servperf has had rates of explained variance of 15.937% for tangibles, 20.719% for reliability, 16.626% for responsiveness, 16.764% for assurance, 20.350% for empathy. On the other hand, the weighted Servqual has had rates of explained variance of 10.860% for tangibles, 14.905% for reliability, 11.462% for responsiveness, 11.748% for assurance, 15.479% for empathy.

Table 3. Results of Exploratory Factor Analysis

Weighted SERVPERF				Weighted SERVQUAL		
Variables	Dimensions	Factor Loadings		Variables	Dimensions	Factor Loadings
Tangibles (α=0.958; VE=%15.937)				Tangibles (α=0.757; VE=%10.860)		

V1	Tangibles1	0.903		V1	Tangibles1	0.771
V2	Tangibles2	0.903		V2	Tangibles2	0.734
V3	Tangibles3	0.894		V3	Tangibles3	0.745
V4	Tangibles4	0.893		V4	Tangibles4	0.740
Reliability (α=0.975; VE=%20.719)				Reliability (α=0.861; VE=%14.905)		
V5	Reliability1	0.924		V5	Reliability1	0.770
V6	Reliability2	0.921		V6	Reliability2	0.745
V7	Reliability3	0.937		V7	Reliability3	0.814
V8	Reliability4	0.932		V8	Reliability4	0.815
V9	Reliability5	0.911		V9	Reliability5	0.698
Responsiveness (α=0.967; VE=%16.626)				Responsiveness (α=0.815; VE=%11.462)		
V10	Responsiveness1	0.946		V10	Responsiveness1	0.765
V11	Responsiveness2	0.938		V11	Responsiveness2	0.747
V12	Responsiveness3	0.944		V12	Responsiveness3	0.722
V13	Responsiveness4	0.937		V13	Responsiveness4	0.683
Assurance (α=0.970; VE=%16.764)				Assurance (α=0.817; VE=%11.748)		
V14	Assurance1	0.937		V14	Assurance1	0.719
V15	Assurance2	0.940		V15	Assurance2	0.753
V16	Assurance3	0.933		V16	Assurance3	0.742
V17	Assurance4	0.940		V17	Assurance4	0.748
Empathy (α=0.969; VE=%20.350)				Empathy (α=0.878; VE=%15.479)		
V18	Empathy1	0.926		V18	Empathy1	0.754
V19	Empathy2	0.903		V19	Empathy2	0.762
V20	Empathy3	0.937		V20	Empathy3	0.803
V21	Empathy4	0.927		V21	Empathy4	0.833
V22	Empathy5	0.918		V22	Empathy5	0.803
N = 1080, KMO = 0.908				N = 1080, KMO = 0.907		
Bartlett's Sph X^2 = 32185.991; p = 0.000				Bartlett's Sph X^2 = 10331.295 ; p = 0.000		
Total Explained Variance = %90.395				Total Explained Variance = %64.454		

When examining the total explained variance in table – III, the weighted Servperf has explained 90.395 per cent of perceived service quality on the other hand; the weighted Servqual has explained 64.454 per cent of perceived service quality.

Table 4. Alternate Service Quality Scales – Correlation Coefficients

	SERVQUAL (P – E)	SERVPERF (P)	WEIGHTED SERVQUAL I(P – E)	WEIGHTED SERVPERF I(P)
SERVQUAL (P – E)	1			
SERVPERF (P)	0.760	1		
WEIGHTED SERVQUAL I(P – E)	0.967	0.751	1	
WEIGHTED SERVPERF I(P)	0.744	0.963	0.776	1

At this stage, convergent and discriminant validity of four measurement scales was assessed by computing correlations coefficients for different pairs of scales. In this regard, it is useful to give some information about the validity of the convergent and discriminant. Convergent validity [2] expresses uniform and a high level of correlation among variables or sub-dimensions which form a structure. Otherwise, discriminant validity expresses an acceptable limit of correlation level among these variables. The results are summarized in table – IV. The presence of a high correlation between alternate measures of service quality is a pointer to the convergent validity of all the four scales. The unweighted Servqual scale is, however, found to have a stronger correlation with other similar measures, Servqual and importance weighted service quality measures. In conclusion, it is the unweighted Servqual scale which is found possessing the highest discriminant validity.

5. Conclusion

According to exploratory factor analysis and correlations coefficients, the validity of and the reliability of the unweighted and weighted Servperf/Servqual scales have been verified in Turkish culture once more in this study.

The dimension which has the largest percentage of explanation is responsiveness/assurance for the unweighted Servperf in the research. Also reliability/responsiveness/assurance has been the dimension which has the largest percentage of explanation for the unweighted Servqual in the research. When the comparison is made on the basis of dimensions, the dimension of empathy has the explanation rate of 11.825 per cent in the unweighted Servperf scale and the explanation rate of 17.409 per cent in the unweighted Servqual. The dimension of tangibles has the explanation rate of 8.908 per cent for in the unweighted Servperf scale and the explanation rate of 11.937 per cent in the unweighted Servqual. The unweighted Servqual has explained more much variance both in the empathy dimension and in the tangibles dimension.

When examining the total explained variance, the unweighted Servqual has explained perceived service quality more than the unweighted Servperf. The difference is close to 1 per cent. The unweighted Servqual has been found to be superior to the unweighted Servperf.

The weighted Servperf has consisted of five dimensions. The dimension which has the largest percentage of explanation is reliability which is closely followed by empathy, for the weighted Servperf

in the research. The weighted Servqual has consisted of five dimensions too. The dimension which has the largest percentage of explanation is empathy which is closely followed by reliability, for the weighted Servqual in the research. In this regard, it is possible to say that the dimensions' variables of empathy and reliability are important both in the weighted Servperf and in the weighted Servqual, **in Turkish air transportation**. When the comparison is made on the basis of dimensions, the dimension of tangibles has the explanation rate of 15.937 per cent in the weighted Servperf scale and the explanation rate of 10.860 per cent in the weighted Servqual. The dimension of reliability has the explanation rate of 20.719 per cent in the weighted Servperf scale and the explanation rate of 14.905 per cent in the weighted Servqual. The dimension of responsiveness has the explanation rate of 16.626 per cent in the weighted Servperf scale and the explanation rate of 11.462 per cent in the weighted Servqual. The dimension of assurance has the explanation rate of 16.764 per cent in the weighted Servperf scale and the explanation rate of 11.748 per cent in the weighted Servqual. Lastly, the dimension of empathy has the explanation rate of 20.350 per cent in the weighted Servperf scale and the rate of 15.479 per cent in the weighted Servqual.

In terms of weighted scales, Servperf has explained more much variance in all dimensions. The weighted Servperf scale's variables also have higher factor loadings. Moreover Servperf has taken the lead within all reliability rates.

When examining the total explained variance, the weighted Servperf has explained perceived service quality much more than the weighted Servqual. The difference is close to 26 percent. The weighted Servperf has been found superior to the weighted Servqual.

The results demonstrated that the weighted SERVQUAL scale exhibited five dimensions which are consistent with theory. Also SERVPERF scale did not demonstrate unidimensional structure which was defended by scale creators. Moreover, the unweighted estimating models have explained service quality in lower rate. As an outcome of the research, estimating service quality with the weighted SERVPERF scale will be a more precious way in the passenger carriage of airline industry.

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