

Service Quality in Public Bus Transport Services : Weighted Gap Score Approach

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Abstract

This paper investigates discrepancy between passengers' expectation and perception towards the quality of services provided by Public Bus Transport Corporation using weighted Service Quality scores by loadings derived from factor analysis. This study uses a convenience sampling method to collect data from 585 passengers of the Public Transport Corporation. The results showed that 'bus service', bus stand service' and 'staff behaviour' dimensions are, the more important, while 'ticket booking' is the least important element of the quality. Finally, managerial implications for the public transport corporation and suggestions for future research are provided.

Keywords : *Service Quality; Transport Services; Weighted Gap Score*

Introduction

In recent years, the service industry has turned into the new engine triggering the growth of the new economy. World-wide companies are carrying out a large investment in service innovation. As a result, service science has become the core of both the academic and practical domains globally, which uses scientific and systematic methods to analyse, manage, and promote service productivity or build up service innovation framework (Liou & Tsao, 2010). In several Asian countries, the public sector occupies an important position in the economy. The public sector should strive to create customer value just as the private sector does (Rahaman & Rahaman, 2009). The development of techniques for customer satisfaction analysis is necessary as they allow the critical aspects of the supplied services to be identified and customer satisfaction to be increased (Metallo & Cuomo, 2000). Bus is a very popular mode of transportation in India because of its low cost and made a great and significant contribution to the national economy. Román, Martín, and Espino (2013) stated that measuring the quality of public services is currently one of the major challenges for economic analysis; this challenge is due to the importance of its results both for companies that provide these services and for the supervisory public administration. Given that public transport services are offered directly to customers, the resultant quality of a service should be seen as an outcome of user perception (Das & Pandit, 2013) because as Bordagaray,

dell'Olio, Ibeas, and Cecín (2013) stated, "Without the consumer, the market has no reason to exist". Therefore, the level of quality in a service will be high when the performance of the service fits customers' needs and expectations. For these reasons, it is important to identify service quality attributes and to establish their importance and influence on customer behaviour. This paper investigates discrepancy between passengers' expectation and perception towards the quality of services provided by Public Bus Transport Corporation using weighted Service Quality scores as a new calculation method.

Service Quality

The service quality measurement is developed by adapting the disconfirmation theory, Grönroos (1982) identifies two service quality dimensions: Functional quality (represents how the service is delivered; that is, it defines customers' perceptions of the interactions that take place during service delivery) and Technical quality (reflects the outcome of the service act, or what the customer receives in the service encounter). The disconfirmation theory also is the basis for Parasuraman, Zeithaml, and Berry (1985) SERVQUAL model with five dimensions (reliability, responsiveness, assurances, empathy, and tangibility), which views service quality as the gap between the expected level of service and customer perceptions of the level received. Several studies used the advance modified versions of the SERVQUAL model (Boulding, Kalra, Staelin, & Zeithaml, 1993; Cronin & Taylor, 1992; Parasuraman, Berry, & Zeithaml, 1991; Parasuraman, Zeithaml, & Berry, 1994; Zeithaml, Berry, & Parasuraman, 1996). (Cronin & Taylor, 1992) stated that there are problems inherent in the use of the disconfirmation paradigm to measure service quality. They suggest that the expectations scale be discarded in favour of a performance-only measure of service quality that they term SERVPERF. Parasuraman et al. (1994) diagnosing controversies relative to their service quality measure, compare the performance of four alternative measures, SERVQUAL, SERVPERF, a summary disconfirmation measure (Brown, Churchill Jr, & Peter, 1993), and a three-column disconfirmation scale that compares a consumers' desired and adequate expectations to their performance perceptions. The results of their investigation suggest that both SERVPERF and the summary disconfirmation measure outperform SERVQUAL. However, the authors recommend the continued use of their gap-based measure due to its superior diagnostic capacity. Previous studies widely used P-E gap to measures service quality (Arabatzis & Grigoroudis, 2010; Chen, Chang, & Lai, 2009; Kassim & Bojei, 2002; Pakdil & Aydin, 2007; Tahir & Abubakar, 2007). Therefore, this study also used P-E gap model to measure service quality of Public Bus Transport Corporation.

Service Quality in Bus Transport services

Public transportation is one of the essential tools most people require in their daily life (Lei & Mac, 2005). As public transport organizations grow older and matured, the

quality of service diminishes gradually and public being left with no option but to accept what is offered (Andreassen, 1994). To overcome this issue in public transport organization the concept of service quality needs to be introduced (Ancarani & Capaldo, 2001). Past researchers have identified different factors of service quality in public transportation services. Hensher and Prioni (2002) identified the service quality index reliability, frequency, walking distance to the bus stop, waiting safety, access to the bus, air conditioning, and cleanliness of seats. Ryus (2003) defined five categories of measures reflect the passenger's point of view in transit services: availability of transit service, service monitoring travel time, safety and security, and maintenance and construction activity on passenger trips. Jen and Lu (2003); (Jen, Tu, & Lu, 2011) reported the service quality dimensions; interaction with passengers, tangible service equipment, convenience of services, operating management support and interpersonal relationships. Wen, Lan, and Cheng (2005) identified important factors of service quality to influence the passengers' loyalty; amenity, crews' attitude, station performance and operational performance. Hu and Jen (2006) developed the scale to measure service quality of city buses in Taipei, the dimension are interaction with passenger, tangible service equipment, convenience of service, operating management support. Eboli and Mazzulla (2007) measured customer satisfaction in the context of bus service on various factors including availability of shelter and benches at bus stops, cleanliness, overcrowding, information system, safety, personnel security, helpfulness of personnel, and physical condition of bus stops. Vanniarajan and Alleswari (2010) identified the Busqual factors such as reliability, staff behaviour, safety, tangibility and cleanliness. The SERVQUAL dimensions are widely used by researchers to evaluate the transport service quality (Awasthi, Chauhan, Omrani, & Panahi, 2011; Huang, Wu, & Hsu, 2006; Randheer & AL-Motawa, 2011; Too & Earl, 2010; Vanniarajan & Stephen, 2008; Wang, Feng, & Hsieh, 2010).

Methodology

Questionnaire Design

The modified SERVQUAL and transport service quality dimensions were taken into consideration based on previous literature (Wen et al., 2005). First part of the questionnaire deals with the measurement of service quality with 31 attributes. The expectations and perceptions were rated using 7-point Likert scale. Perceptions were rated from 1-strongly disagree to 7-strongly agree, and expectations were rated from 1-unimportant to 7-very important. To ensure the content validity, the survey instrument was revised and finalized according to feedback from eight academicians who are working in the area of service quality and a pre-test sample of 25 postgraduate students. Finally the questionnaire was corrected by subject experts, based on their suggestions the necessary changes has been made. The second Part of the questionnaire presents respondents' demographic information (sex, age, education, family income, and travel purpose).

Sampling and Survey Procedure

The sample in this study consists of passengers who used the long distance buses of Tamil Nadu State Transport Corporation. The survey was administered over five weeks. To make more representativeness of the sample, the survey procedure was performed on three different places based on convenience sampling procedure. 800 questionnaires were distributed and 585 usable ones were obtained. After eliminated incomplete responses and passengers who have not travelled more than two times in the preceding month, there was an effective response rate of 73.12%. Of the respondents, 66.6% were male and 33.5% were female, the average age is 23.5 ranged between 19 years to 38 years, the average monthly family income Rs. 18000 ranged between Rs.3000 to Rs. 150,000.

Data Cleaning and Purification Process

Non-response to questionnaire surveys may potentially bias results, as those who respond may differ in some systematic way from non-respondents. Examination of the data suggested that non-response bias is not present in the data set. Fifty five respondents were removed because they had missing data in the questionnaire and thirty responses were deleted as they did not answer the questionnaire accurately or did not read the items.

Data Analysis

The collected data is analysed using principal component analysis for identifying underlying dimensions of bus transport service quality. The independent sample t test is conducted to compare the difference between expectation and perception gap scores using SPSS 21.0 version. To test the measurement properties of the scale we first conducted reliability analysis by grouping the items according to the six a priori conceptual dimensions from past literature. We then reduced the list of items within each dimension by examining corrected item-to-total correlations and deleting items whose elimination improved reliability coefficient alpha. To minimize the common method bias, the study conducted Post hoc test (Harman single factor) as recommended by Podsakoff, MacKenzie, Lee, and Podsakoff (2003) found that the items did not significantly load onto a single factor. Hence the study ensured that the data is free from the common method bias.

Method of Calculating Weighted Score for Expectation and Perception

Computing the weighted score expectation and perception Pakdil and Aydin (2007) method was adopted. Factor analysis was performed for both expectation and perception; actual scores were converted into new weighted scores based on scores weighted by factor loadings. In computing the expectation score for each factor (F_{t_i}), passengers' evaluations were weighted by the concerned factor loadings as given in Eq (1). For $i = 1, 2, \dots, n$, where n is the number of passengers; $t = 1, 2, \dots, m$, where m is the number of factors, and w_j is the factor loading of j^{th} item, $j = 1, 2, \dots, k$, where k is the number of items included in t^{th} factor,

where x_{jei} is the i^{th} respondent's expectation score for j^{th} item,

$$Ft_{ei} = W_1 \times X_{1ei} + W_2 \times X_{2ei} + \dots + W_k \times X_{kei}$$

$$= \sum_{j=1}^k w_j \times X_{(jei)} \quad (1)$$

and for the perception score, the weighted score calculated for a factor is

$$Ft_{pi} = W_1 \times X_{1pi} + W_2 \times X_{2pi} + \dots + W_k \times X_{kpi}$$

$$= \sum_{j=1}^k w_j \times X_{(jpi)} \quad (2)$$

where x_{jpi} is the i^{th} passenger's perception score for j^{th} item. For example, the first factor, F1-staff behaviour, includes Q1, Q2, Q3, Q4, Q5 and Q6 items; with the factor loadings 0.736, 0.721, 0.716, 0.681, 0.650 and 0.648, respectively (Table 1). If the first respondent scored his/her expectations for Q1 as 7; Q2 as 6, Q3 as 5 Q4 as 4, Q5 as 3 and Q6 as 1, then his/her F1 score is 18.38. Each respondent's expectation and perception scores were computed, respectively.

Results

An individual item analysis (Table 1) of the scale showed that the expectations items had mean scores ranging from 5.42 for item E11 "Special attention is given to passengers from other cities, states, etc" to 5.98 for item E13 "Special care is taken for senior citizens & physically challenged persons". Item E23 "Bus stops toilets are well maintained" had the largest standard deviation of 1.75. The item to total scale(Pearson) correlations for the expectations items ranged from .54 to 0.81. Item E1 "Ticket office is located at an easily accessible place" had the lowest correlation coefficient of .54.

Table 1
Summary of Item-Total Correlations, Means and Standard Deviations of Expectation Scale

Expectation Items		Item-total Correlation	M	SD
Ticket booking				
E1	Ticket office is located at an easily accessible place	.54	5.80	1.44
E2	I can book tickets for my journey without any difficulty	.57	5.87	1.47

E3	Information given at the reservation counters is understandable	.58	5.70	1.49
E4	Employees of the ticket offices are responsive	.63	5.75	1.49
Bus Services				
E5	Buses are in good condition	.74	5.88	1.56
E6	The interiors of the buses are clean & hygienic	.72	5.88	1.56
E7	Buses have adequate lighting facilities inside	.65	5.59	1.38
E8	Bus windows are in good condition	.77	5.70	1.50
E9	Bus engine is smooth and doesn't make more noise	.69	5.67	1.50
E10	Buses have comfortable and spacious seats	.74	5.82	1.46
Empathy				
E11	Special attention is given to passengers from other cities, states, etc.	.61	5.42	1.67
E12	Adequate care is taken in case of any emergency	.73	5.88	1.45
E13	Special care is taken for senior citizens & physically challenged persons	.75	5.98	1.47
E14	Special care is taken for women & children	.77	5.78	1.48
Reliability				
E15	Buses departure on time	.76	5.75	1.50
E16	Buses reach your destination on time	.79	5.81	1.50
E17	The emergency exit door is visually appealing in buses	.71	5.74	1.57
E18	Buses have adequate safety and security measures	.77	5.91	1.50
E19	Buses travel at a normal speed	.59	5.53	1.51
Bus Stand Services				
E20	Infrastructure/ Facilities are well maintained at the bus stops	.80	5.64	1.60
E21	Bus stops have adequate shelter and chairs	.78	5.65	1.48
E22	Bus stops have adequate facilities (toilets, water, parking etc.)	.79	5.74	1.63
E23	Bus stops toilets are well maintained	.78	5.76	1.75
E24	Bus stops have adequate facilities for food and beverages	.71	5.62	1.51
E25	Bus stops have adequate safety and security measures (Video monitors, security personnel, etc.)	.74	5.61	1.57
Staff Behaviour				
E26	The staff satisfy passengers' requests right at the first time	.76	5.56	1.49
E27	The staff are always willing to help passengers	.81	5.70	1.44

E28	The staff answer the passenger queries properly	.81	5.72	1.42
E29	The staff are always polite	.76	5.67	1.52
E30	The staff understand passengers' needs	.77	5.65	1.45
E31	The staff behaviour is courteous	.75	5.68	1.39

An individual item analysis (Table 2) of the scale showed that the perception items had mean scores ranging from 2.52 for item P23 "Bus stops toilets are well maintained" to 4.41 for item P2 "I can book tickets for my journey without any difficulty" and item P7 "Buses have adequate lighting facilities inside". Item P13 "Special care is taken for senior citizens & physically challenged persons" and item P22 "Bus stops have adequate facilities (toilets, water, parking etc.)" had the largest standard deviation of 1.84. The item to total scale (Pearson) correlations for the perceptions items ranged from .33 to .70. Item P2 "I can book tickets for my journey without any difficulty" had the lowest correlation coefficient of .33.

Sample Adequacy

The sample consisted of 585 passengers who travelled the long distance buses of Tamil Nadu State Transport Corporation. To check the sample appropriateness is Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy statistic which indicates the proportion of variance in variables that might be caused by underlying factors. This index ranges from 0 to 1, reaching 1 when each variable is perfectly predicted without error by the other variables. The KMO value must exceed 0.50 for both the overall fit and each individual variable, and the value above 0.8 is considered meritorious (Hair et al., 2008). The KMO measure value for expectation and perception scales are .93 and .96 respectively.

Table 2

Summary of Item-Total Correlations, Means and Standard Deviations of Perception Scale

Perception Items	Item-total Correlation	M	SD
Ticket booking			
P1 Ticket office is located at an easily accessible place	.34	4.40	1.67
P2 I can book tickets for my journey without any difficulty	.33	4.41	1.76
P3 Information given at the reservation counters is understandable	.42	4.25	1.75
P4 Employees of the ticket offices are responsive	.51	3.99	1.73
Bus Services			
P5 Buses are in good condition	.58	3.67	1.75
P6 The interiors of the buses are clean & hygienic	.56	3.39	1.74

P7	Buses have adequate lighting facilities inside	.52	4.41	1.56
P8	Bus windows are in good condition	.60	3.59	1.72
P9	Bus engine is smooth and doesn't make more noise	.58	3.66	1.63
P10	Buses have comfortable and spacious seats	.60	3.72	1.67
Empathy				
P11	Special attention is given to passengers from other cities, states, etc.	.54	3.54	1.79
P12	Adequate care is taken in case of any emergency	.56	3.88	1.75
P13	Special care is taken for senior citizens & physically challenged persons	.54	3.96	1.84
P14	Special care is taken for women & children	.55	4.06	1.81
Reliability				
P15	Buses departure on time	.53	3.87	1.80
P16	Buses reach your destination on time	.56	3.79	1.79
P17	The emergency exit door is visually appealing in buses	.52	3.66	1.83
P18	Buses have adequate safety and security measures	.57	3.50	1.68
P19	Buses travel at a normal speed	.48	4.22	1.65
Bus Stand Services				
P20	Infrastructure/ Facilities are well maintained at the bus stops	.62	3.07	1.71
P21	Bus stops have adequate shelter and chairs	.56	3.56	1.76
P22	Bus stops have adequate facilities (toilets, water, parking etc.)	.61	3.11	1.84
P23	Bus stops toilets are well maintained	.63	2.52	1.76
P24	Bus stops have adequate facilities for food and beverages	.49	3.88	1.76
P25	Bus stops have adequate safety and security measures (Video monitors, security personnel, etc.)	.56	3.15	1.75
Staff Behaviour				
P26	The staff satisfy passengers' requests right at the first time	.67	3.61	1.63
P27	The staff are always willing to help passengers	.68	3.65	1.62
P28	The staff answer the passenger queries properly	.65	3.65	1.64
P29	The staff are always polite	.65	3.33	1.67
P30	The staff understand passengers' needs	.70	3.57	1.66
P31	The staff behaviour is courteous	.66	3.63	1.66

Table 3
Factor Loadings, Construct Reliability, and Convergent Validity of Service Quality Expectation Scale

Dimensions and Indicators	Loadings	Alpha	CR	AVE
Staff Behaviour		.93	.93	.70
The staff satisfy passengers' requests right at the first time	.65			
The staff are always willing to help passengers	.72			
The staff answer the passenger queries properly	.74			
The staff are always polite	.72			
The staff understand passengers' needs	.68			
The staff behaviour is courteous	.65			
Bus Stand Services		.92	.93	.69
Infrastructure/ Facilities are well maintained at the bus stops	.58			
Bus stops have adequate shelter and chairs	.66			
Bus stops have adequate facilities (toilets, water, parking etc.)	.78			
Bus stops toilets are well maintained	.72			
Bus stops have adequate facilities for food and beverages	.63			
Bus stops have adequate safety and security measures (Video monitors, security personnel, etc.)	.62			
Bus Services		.90	.87	.53
Buses are in good condition	.70			
The interiors of the buses are clean & hygienic	.76			
Buses have adequate lighting facilities inside	.67			
Bus windows are in good condition	.71			
Bus engine is smooth and doesn't make more noise	.63			
Buses have comfortable and spacious seats	.60			
Reliability		.85	.89	.61
Buses departure on time	.76			
Buses reach your destination on time	.80			
The emergency exit door is visually appealing in buses	.59			
Buses have adequate safety and security measures	.56			
Buses travel at a normal speed	.58			

Empathy		.84	.86	.62
Special attention is given to passengers from other cities, states, etc.	.57			
Adequate care is taken in case of any emergency	.70			
Special care is taken for senior citizens & physically challenged	.79			
Special care is taken for women & children	.73			
Ticket booking		.78	.78	.50
Ticket office is located at an easily accessible place	.67			
I can book tickets for my journey without any difficulty	.69			
Information given at the reservation counters is understandable	.63			
Employees of the ticket offices are responsive	.65			

Note: CR= Composite Reliability, AVE= Average Variance Extracted

The underlying dimensions for the set of expectation statements and the set of perception were identified through principal components analyses of the passengers' responses. Each group of variables was analyzed by using a varimax rotation, with a factor loading of .5 or better. We used the breaks-in-eigenvalues criterion to determine the initial number of factors to retain. We then went through a series of iterations, each involving elimination of items with low loadings on all factors or high cross-loadings on two or more factors, followed by factor analysis of the remaining items. This iterative process resulted in the final service quality scale, consisting of 31 items on six dimensions, which we labelled as follows: (1) staff behaviour, (2) bus stand services, (3) bus services, (4) reliability and assurance, (5) empathy and (6) ticket booking.

Table 4

Factor Loadings, Construct Reliability, and Convergent Validity of Service Quality Perception Scale

Dimensions and Indicators	Loadings	Alpha	CR	AVE
Staff Behaviour		.89	.91	.64
The staff satisfy passengers' requests right at the first time	.65			
The staff are always willing to help passengers	.72			
The staff answer the passenger queries properly	.74			
The staff are always polite	.72			

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The staff understand passengers' needs	.68			
The staff behaviour is courteous	.65			
Bus Stand Services		.83	.88	.54
Infrastructure/ Facilities are well maintained at the bus stops	.58			
Bus stops have adequate shelter and chairs	.66			
Bus stops have adequate facilities (toilets, water, parking etc.)	.78			
Bus stops toilets are well maintained	.72			
Bus stops have adequate facilities for food and beverages	.63			
Bus stops have adequate safety and security measures (Video monitors, security personnel, etc.)	.62			
Bus Services		.83	.88	.55
Buses are in good condition	.70			
The interiors of the buses are clean & hygienic	.76			
Buses have adequate lighting facilities inside	.66			
Bus windows are in good condition	.71			
Bus engine is smooth and doesn't make more noise	.63			
Buses have comfortable and spacious seats	.60			
Reliability		.70	.81	.50
Buses departure on time	.76			
Buses reach your destination on time	.80			
The emergency exit door is visually appealing in buses	.59			
Buses have adequate safety and security measures	.56			
Buses travel at a normal speed	.58			
Empathy		.77	.85	.59
Special attention is given to passengers from other cities, states, etc.	.57			
Adequate care is taken in case of any emergency	.70			
Special care is taken for senior citizens & physically challenged	.79			
Special care is taken for women & children	.73			
Ticket booking		.64	.79	.51
Ticket office is located at an easily accessible place	.67			

I can book tickets for my journey without any difficulty	.68
Information given at the reservation counters is understandable	.63
Employees of the ticket offices are responsive	.65

Note: CR= Composite Reliability, AVE= Average Variance Extracted

Reliability

To evaluate reliability, the most commonly accepted measure is internal consistency reliability using Cronbach's Alpha and composite reliability values. Cronbach's Alpha values are highly satisfactory for both service quality expectation (.78 to .91) and perception measures (.64 to .89) and exceeds the common threshold of .70 except ticketing dimension (.64) in perception scale; Constructs' composite reliability is also highly satisfactory for both service quality expectation (.78 to .93) and perception measures (.79 to .91), and exceeds the common threshold of 0.70. (Roldán & Franco, 2012).

Validity

To achieve the convergent validity all standardized factor loadings should be greater than .70 and the average variance extracted (AVE) for measures is greater than .50 (Fornell & Larcker, 1981). In the present study the standardised factor loadings for expectation scale are ranged from .56 to .80 and AVE values are ranged between .50 to .70. Similarly, the standardised factor loadings for perception scale are ranged from .56 to .80 and AVE values are ranged between .50 to .64. Hence, the study established the convergent validity for the latent constructs.

Gap Scores among the Service Quality Dimensions

To calculate the difference in the score between the 31 statements the SERVQUAL method was used (Parasuraman, Zeithaml, & Berry, 1988). The negative score indicates the passengers perceived that the level of service provided by the transport corporation did not meet their expectations. Table 5 exhibited that there were some differences in magnitude of the gap score among the dimensions of service quality: ticket booking, bus services, empathy, reliability, bus stand services and staff behaviour. The result also showed that none of the items of service quality had a positive gap score; it is an evident that passengers were generally not satisfied with the service provided by the public transport corporation. The service quality dimensions were ranked based on the size of the gap score, the priority of service quality had been assessed and the results were presented in Table 3.

Table 5
Gap Score among the Service Quality Dimensions

Dimensions	P		E		Gap (P-E)	t	Priority
	M	SD	M	SD			
Ticket booking	17.03	4.83	23.09	4.63	-6.06	22.04**	6
Bus Services	22.38	7.47	34.51	7.37	-12.12	27.12**	3
Empathy	15.44	5.54	23.06	4.98	-7.62	24.07**	5
Reliability	19.06	6.45	28.73	5.98	-9.67	26.02**	4
Bus Stand Services	19.13	7.84	34.02	8.04	-14.90	30.38**	1
Staff Behaviour	21.45	7.90	33.98	7.49	-12.54	26.78**	2

Note: ** $p < .01$.

From the table 5, it is inferred that the bigger gap score, the more serious the service quality shortfall for the passenger viewpoint. The most important dimension was "bus stand services" (-14.90), the second most important dimension was "staff behaviour " (-12.54). Finally, the least important dimension was "ticket booking" (-6.06). The un-weighted gap score among the five service quality dimensions indicated that the public transport corporation fell short of the customer's expectation on each dimension. Considering the un-weighted gap score, the service quality dimensions were ranked based on the size of the gap score. The bigger the gap is, the more important the dimensions from passengers' view, which could be ranked in the following order: bus stand services, staff behaviour, bus services, reliability, empathy and ticket booking.

Weighted Gap Score among the Service Quality Dimensions

Table 6
Weighted Gap Score among the Service Quality Dimensions

Dimensions	P		E		Gap (P-E)	t	Priority
	M	SD	M	SD			
Ticket booking	11.23	3.18	15.35	3.08	-4.12	22.66**	5
Bus Services	15.12	5.09	24.59	4.35	-9.47	33.24**	2
Empathy	10.84	3.90	13.69	2.95	-2.86	13.77**	6
Reliability	12.54	4.32	17.20	3.56	-4.66	19.73**	4
Bus Stand Services	12.67	5.26	23.32	5.53	-10.65	31.97**	1
Staff Behaviour	14.84	5.47	21.52	4.75	-6.68	21.46**	3

Note: ** $p < .01$.

From Table 6, the "bus stand services" dimension had the biggest weighted gap score of -10.65, followed by "bus services" (-9.47), "staff behaviour" (-6.68), "reliability" (-4.66), "ticket booking" (-4.12), and "empathy" (-2.86). Finally, the table 5 showed that there was a significant difference in priority or ranking between un-weighted and weighted scores from passenger's perspective.

Table 7

Comparison of Weighted and Un-weighted Gap Scores among the Six Service Quality Dimensions

Dimension	Weighted Gap Score	Un weighted Gap Score
Ticket booking	-4.12	-6.06
Bus Services	-9.47	-12.12
Empathy	-2.86	-7.62
Reliability	-4.66	-9.67
Bus Stand Services	-10.65	-14.90
Staff Behaviour	-6.68	-12.54

From the table 7, it can be observed that there is a differences between weighted and un-weighted Gap scores in ranking the service quality dimensions. The weighted gap score of service quality is better approach to rank the service quality dimensions. To compare of the passengers' actual perceptions of service quality with their expectations, the paired t-test was conducted and the results showed a statistically significant difference in all five dimensions weredisplayed in Table 5. Finally, it can be summarized that passengers' perception of public transport corporation service quality did not meet with their expectations.

Conclusions and Managerial Implications

The highly competitive market conditions in the bus transport sector pressurises public transport corporations to deliver high-quality services. To provide this, public transport corporations must first understand passengers' needs and expectations. Next, they should focus on how to deliver the most convenient service to meet passengers' needs. This study develops a new structure to define public transport corporation's service quality dimensions. The service quality dimensions are almost similar to those presented in previous studies (Eboli & Mazzulla, 2008; Philip & Hazlett, 1997; Ryus, 2003; Vanniarajan & Alleswari, 2010). The result of Gap analyses showed that passengers' perceptions of the bus transport corporation in India were consistently lower than their expectations. Hence, negative gaps, especially pertaining to "bus stand services", "bus services", and "staff behaviour" were important to consider in terms of making improvement efforts. The bigger the gap, the

serious the level of service quality that need to be improved, from the customers' point of view. These results provide powerful information for future policymaking due to the fact that once the transport planners know the variables that users value the most; they can define more efficient strategies for improvements.

Scope for Further Research

The findings of the study pertaining to Tamil Nadu State Transport Corporation, further research should be conducted having a large data nationwide. Obtaining larger samples of respondents in further studies would facilitate a more robust examination of changes in perceived - expected service quality relationship. The further research should also focus on the affect of the management's expectation and the user's expectation levels.

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References

- Ancarani, A., & Capaldo, G. (2001). Management of standardised public services: a comprehensive approach to quality assessment. *Managing Service Quality*, 11(5), 331-341. doi: 10.1108/09604520110404059
- Andreassen, Tor Wallin. (1994). Satisfaction, Loyalty and Reputation as Indicators of Customer Orientation in the Public Sector. *International Journal of Public Sector Management*, 7(2), 16-34. doi: 10.1108/09513559410055206
- Arabatzis, Garyfallos, & Grigoroudis, Evangelos. (2010). Visitors' satisfaction, perceptions and gap analysis: The case of Dadia-Lefkimi-Souflion National Park. *Forest Policy and Economics*, 12(3), 163-172. doi: <http://dx.doi.org/10.1016/j.forpol.2009.09.008>
- Awasthi, Anjali, Chauhan, Satyaveer S., Omrani, Hichem, & Panahi, Ariyo. (2011). A hybrid approach based on SERVQUAL and fuzzy TOPSIS for evaluating transportation service quality. *Computers & Industrial Engineering*, 61(3), 637-646. doi: <http://dx.doi.org/10.1016/j.cie.2011.04.019>
- Bordagaray, Maria, dell'Olio, Luigi, Ibeas, Angel, & Cecín, Patricia. (2013). Modelling user perception of bus transit quality considering user and service heterogeneity. *Transportmetrica A: Transport Science*, 10(8), 705-721. doi: 10.1080/23249935.2013.823579
- Boulding, William, Kalra, Ajay, Staelin, Richard, & Zeithaml, Valarie A. (1993). A dynamic process model of service quality: From expectations to behavioral intentions. *Journal of Marketing Research*, 30(1), 7-27. doi: 10.2307/3172510

- Brown, Tom J., Churchill Jr, Gilbert A., & Peter, J. Paul. (1993). Improving the measurement of service quality. *Journal of Retailing*, 69(1), 127-139. doi: [http://dx.doi.org/10.1016/S0022-4359\(05\)80006-5](http://dx.doi.org/10.1016/S0022-4359(05)80006-5)
- Chen, Kee-Kuo, Chang, Ching-Ter, & Lai, Cheng-Sheng. (2009). Service quality gaps of business customers in the shipping industry. *Transportation Research Part E: Logistics and Transportation Review*, 45(1), 222-237. doi: <http://dx.doi.org/10.1016/j.tre.2008.02.005>
- Cronin, J. Joseph, Jr., & Taylor, Steven A. (1992). Measuring Service Quality: A Reexamination and Extension. *Journal of Marketing*, 56(3), 55-68. doi: 10.2307/1252296
- Das, Shreya, & Pandit, Debapratim. (2013). Importance of user perception in evaluating level of service for bus transit for a developing country like India: a review. *Transport Reviews*, 33(4), 402-420. doi: 10.1080/01441647.2013.789571
- Eboli, Laura, & Mazzulla, Gabriella. (2007). Service quality attributes affecting customer satisfaction for bus transit. Paper presented at the Journal of Public Transportation.
- Eboli, Laura, & Mazzulla, Gabriella. (2008). A Stated Preference Experiment for Measuring Service Quality in Public Transport. *Transportation Planning and Technology*, 31(5), 509-523. doi: 10.1080/03081060802364471
- Grönroos, Christian. (1982). An Applied Service Marketing Theory. *European Journal of Marketing*, 16(7), 30-41. doi: 10.1108/EUM00000000004859
- Hensher, David A., & Prioni, Paola. (2002). A Service Quality Index for Area-Wide Contract Performance Assessment. *Journal of Transport Economics and Policy*, 36(1), 93-113. doi: 10.2307/20053894
- Hu, Kai-Chieh, & Jen, William. (2006). Passengers' Perceived Service Quality of City Buses in Taipei: Scale Development and Measurement. *Transport Reviews*, 26(5), 645-662. doi: 10.1080/01441640600679482
- Huang, Yuan-Chih, Wu, Chih-Hung, & Hsu, CJ. (2006). Using importance-performance analysis in evaluating Taiwan medium and long distance national highway passenger transportation service quality. *Journal of American Academy of Business*, 8(2), 98-104.
- Jen, William, & Lu, Tang Jung. (2003). Effects of service quality, customer satisfaction and switching barriers on passenger behavioral intentions in scheduled coach service. Paper presented at the Proceedings of the Eastern Asia Society for Transportation Studies.
- Jen, William, Tu, Rungting, & Lu, Tim. (2011). Managing passenger behavioral intention: an integrated framework for service quality, satisfaction, perceived value, and switching barriers. *Transportation*, 38(2), 321-342. doi: 10.1007/s11116-010-93069
- Kassim, Norizan Mohd, & Bojei, Jamil. (2002). Service quality: gaps in the Malaysian telemarketing industry. *Journal of Business Research*, 55(10), 845-852. doi: [http://dx.doi.org/10.1016/S0148-2963\(00\)00224-1](http://dx.doi.org/10.1016/S0148-2963(00)00224-1)

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- Lei, Mandy, & Mac, Lancy. (2005). Service quality and customer loyalty in a Chinese context: does frequency of usage matter? Paper presented at the ANZMAC 2005 Conference: Services Marketing.
- Liou, Yiching, & Tsao, Wen-Yu. (2010). A study on the service model of public transportation: Taiwan railways vs Taiwan high speed rail corporation. *Service Science*, 1(2), 32-42.
- Metallo, Gerardo, & Cuomo, Maria Teresa. (2000). La customer satisfaction come strumento relazionale e di ascolto per una nuova Pubblica Amministrazione. *Micro & Macro Marketing*, 9(1), 51-78.
- Pakdil, Fatma, & Ayd?n, Özlem. (2007). Expectations and perceptions in airline services: An analysis using weighted SERVQUAL scores. *Journal of Air Transport Management*, 13(4), 229-237. doi: <http://dx.doi.org/10.1016/j.jairtraman.2007.04.001>
- Parasuraman, A., Berry, Leonard L., & Zeithaml, Valarie A. (1991). Refinement and reassessment of the SERVQUAL scale. *Journal of Retailing*, 67(4), 420-450.
- Parasuraman, A., Zeithaml, Valarie A., & Berry, Leonard L. (1985). A Conceptual Model of Service Quality and Its Implications for Future Research. *Journal of Marketing*, 49(4), 41-50. doi: 10.2307/1251430
- Parasuraman, A., Zeithaml, Valarie A., & Berry, Leonard L. (1988). SERVQUAL: A multiple-item scale for measuring consumer perceptions of service quality. *Journal of Retailing*, 64(1), 12-40.
- Parasuraman, A., Zeithaml, Valarie A., & Berry, Leonard L. (1994). Reassessment of Expectations as a Comparison Standard in Measuring Service Quality: Implications for Further Research. *Journal of Marketing*, 58(1), 111-124. doi: 10.2307/1252255
- Philip, George, & Hazlett, Shirley-Ann. (1997). The measurement of service quality: a new P-C-P attributes model. *International Journal of Quality & Reliability Management*, 14(3), 260-286. doi: 10.1108/02656719710165482
- Price, James L. (1997). Handbook of organizational measurement. *International Journal of Manpower*, 18(4), 305-558. doi: 10.1108/01437729710182260
- Rahaman, Khan Rubayet, & Rahaman, Md Arifur. (2009). Service Quality Attributes Affecting The Satisfaction Of Railway Passengers Of Selective Route In Southwestern Part Of Bangladesh. *Theoretical and Empirical Researches in Urban Management*, 4(3 (12)), 115-125.
- Randheer, Kokku, & AL-Motawa, Ahmed A. (2011). Measuring Commuters' Perception on Service Quality Using SERVQUAL in Public Transportation. *International Journal of Marketing Studies*, 3(1).
- Román, Concepción, Martín, Juan Carlos, & Espino, Raquel. (2013). Using Stated Preferences to Analyze the Service Quality of Public Transport. *International Journal of Sustainable Transportation*, 8(1), 28-46. doi: 10.1080/15568318.2012.758460
- Ryus, Paul. (2003). A Summary of TCRP Report 88: A Guidebook for Developing a Transit Performance-Measurement System. *TCRP Research Results Digest*(56).

- Tahir, I, & Abubakar, N. (2007). Service quality gap and customers satisfactions of commercial banks in Malaysia. *International Review of Business Research Papers*, 3(4), 327-336.
- Too, Linda, & Earl, George. (2010). Public transport service quality and sustainable development: a community stakeholder perspective. *Sustainable Development*, 18(1), 51-61. doi: 10.1002/sd.412
- Vanniarajan, T., & Alleswari, A. (2010). Busqual and Repurchase Intention Among The Passengers: An Empirical Study. *Journal of Marketing & Communication*, 6(1), 10-17.
- Vanniarajan, T., & Stephen, A. (2008). Railqual and Passengers Satisfaction: An Empirical Study in Southern Railways. *Asia Pacific Business Review*, 4(1), 64-75. doi: 10.1177/097324700800400107
- Wang, Shu-Mei, Feng, Cheng-Min, & Hsieh, Cheng-Hsien. (2010). Stakeholder perspective on urban transport system service quality. *Total Quality Management & Business Excellence*, 21(11), 1103-1119. doi: 10.1080/14783363.2010.529329
- Wen, Chieh Hua, Lan, Lawrence, & Cheng, Hsiu Ling. (2005). Structural Equation Modeling to Determine Passenger Loyalty Toward Intercity Bus Services. *Transportation Research Record: Journal of the Transportation Research Board*, 1927(-1), 249-255. doi: 10.3141/1927-28
- Zeithaml, Valarie A., Berry, Leonard L., & Parasuraman, A. (1996). The behavioral consequences of service quality. *Journal of Marketing*, 60(2), 31-46. doi: 10.2307/1251929