Passengers' Perception of Service Quality: A Study With Reference to Madurai Division of Southern Railway

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Abstract

After globalization, service quality has assumed greater significance in rail transport owing to rail passengers' expectation of improved service quality in Indian Railways (IR), as well as existence of keen competition from the road transportation sector. Service quality is a business management term used to indicate achievement in service. Usually, service quality yields comfort to the passengers; it would delight them when the passengers' perception of service quality exceeds their expectations. In this context, service quality comes under the scanner of a comparison of passengers' expectation with performance of Madurai Division of Southern Railway (SR) Zone of Indian Railway. This research paper is an outcome of the present author's research project sponsored under ICSSR's Senior Fellowship.

1. Introduction

Indian Railway (IR) is the public enterprise, owned and run by the Union Government through the Ministry of Railway. The IR is one of the world's largest public utility services in terms of the number of employees and rolling stock. For administrative convenience, IR is divided into 17 zones including Southern Railway (SR) zone; these zones are further subdivided into divisions. At present, the SR has six railway divisions such as Chennai, Madurai, Palghat, Salem, Trichy and Trivandrum. Madurai Railway Division was formed in 1856; it spans over 1,356 kilometres making it the largest railway division of SR[1]. At present, the Madurai division covers 11 districts in Tamil Nadu and one district in Kerala. Under the modern consumerism, rail passengers are craving for quality service from the SR/IR. The Ministry of Railway has to ponder over the service quality of SR/IR where for mass movement of men and materials, rail transport is highly suitable.

2. Review of Literature

Rajeswari and Santa Kumari (2014) investigated the passengers' perception of service quality of Indian Railway. They applied a modified SERVQUAL instrument including eight service quality dimensions. Results indicated that passengers perceived the quality of service delivered was not satisfactory.Hemant Sharma and Sonali Yadav (2013) in their paper on "Service quality improvement-An empirical study of Indian Railways" found the customers' perception of service quality with the SERVQUAL instrument in terms of five dimensions of service quality, i.e., tangibles, reliability, responsiveness, empathy, and assurance.Balakrishnan's study (2012) focused on service quality attributes impacting passenger satisfaction with rail service. He concluded that the railway administration had failed to take necessary steps for the improvement of services towards their passengers.

BodhibrataNag (2012) discusses the measures adopted to check malpractices in public procurement in the Indian Railways. He points out that internal and external check by independent bodies and strong

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organizational structures have contributed to procurement processes safeguarding institutional interests.

Rajasekhar and Devi Prasad (2011) explored the concept of rail transport service quality with the standard scale of SERVQUAL developed by Parasuraman et al. They concluded that raising the service quality is one of the ways to improve the competitiveness of passenger's traffic. Ngatia et al (2010) concluded that safety and travel cost are the significant variables of service quality in travel industry. Chopra Vikram (2009) describes the achievements of passenger reservation system. The improvement in unreserved ticketing has become a boon for ordinary passengers. The present study deviates from the earlier studies by developing a new multi instrument, i.e., R-S QUAL (and is not based on the standard SERVQUAL scale developed by Parasuraman and others) to measure service quality of SR by gap analysis-mean value analysis.

3. Statement of the Problem

Improvement in service quality of SR/IR is severely hampered by funds crunch. A large part of revenue of IR is obtained from freight traffic and the passenger fare is cross subsidized with profit earning freight traffic. To worsen the situation, the IR is losing freight traffic to road transportation. Table 1 shows the net loss of Southern Railway (SR) zone of IR for the period 2011-2012 to 2013-2014.

Table 1 Net loss of Southern Railway Zone of IR year wise

Year	Gross earnings (Rs. in 000')	Working expenses (Rs.in 000')	Net earnings/ (Rs.in 000')
2011-2012	56,08,07,60	68,74,32,58	-16,66,24,98
2012-2013	60,28,75,34	78,73,20,46	-18,44,45,12
2013-2014	68,45,54,54	90,48,12,96	-22,02,58,42

Source: www.Indianrailways.gov.in

The above discussion/analysis pinpoints lack of funds of IR/SR. the government of India cannot shut its eyes on improving the service quality of SR/IR citing the case of funds crunch. The Ministry of Indian Railway has to balance both these aspects, namely, augmenting its financial resources and upgrading its service quality.

4. The Objectives of the Study are

- To study the passengers' perceived level of service quality in Madurai division of Southern Railway zone of IR.
- To study the passengers' expected level of service quality in Madurai division of SR.
- To identify priorities for improvement (PFI) in service quality attributes in the study division for SR by performing gap analysis.

5. Data and Methodology

The study depended primarily on primary data which were collected through a structured and an undisguised questionnaire. The researcher combined random sampling method with non random sampling method for selecting 434 sample passengers in the study division of SR. Statistical formula was used for determining the sample size. The sample survey was conducted for a period of nine months, in 2016-2017. Relevant statistical tools such as percentage calculation, weighted average, confirmatory factor analysis (CFA) and paired t-test were applied. Gap analysis was made to find the difference between passengers' perceived mean value and expected mean value in service quality attributes of SR.

Hypotheses:

H_{01}: There is no difference between expected level and perceived level of rail passengers in terms of the dimension 'basic amenities' in SR.

H_{02}: There is no difference between expectation and perception of passengers in terms of dimension modern amenities in Madurai division of SR.

H_{03}: There is no difference between expectation and perception of passengers for the dimension ticket booking facilities of SR.

H_{04}: There is no variation between expectation and perception of passengers for the dimension service operational activities of SR.

6.   Results and Discussion

Service quality denotes a gap between one's perceived and expected level of service. Most studies in the area of service quality have been based on the model developed by Parasuraman et al. (1985, 1988) which makes a comparison of customer expectation and perception of service delivery. In 1988, they modified the previous ten dimensions to five dimensions of service quality, i.e., reliability, assurance, tangibles, empathy and responsiveness or 'RATER' scale. Parasuraman, Zeithaml and Berry evolved a 22 item multiple attribute scale termed SERVQUAL to measure service quality in service and retail concerns; the SERVQUAL scale measured service quality along five district dimensions/factors, namely, Reliability, Assurance, Tangibility, Empathy, and Responsiveness (RATER) by performing gap analysis.

It is to be noted that several authors in their studies have used SERVQUAL scale with the above mentioned five dimensions to measure service quality in trading and financial concerns; at the same time, several others have objected to SERVQUAL instrument to measure service quality. In his ICSSR's sponsored project, the present author has conceptualized rail passengers' perception of service quality as their level of experience with service quality attributes and their expectations as how these attributes are considered important by the passengers in Madurai division of SR. In this context, it is apt to note that the renowned author Cross by (1979) defined service quality in this sense, namely, "service quality is the conformance to requirements".

Service quality in India railway- a mammoth public utility concern is totally different from any other product/service environment. The present author has evolved a 29 item multiple attribute scale compressed into two main dimensions(captioned "R-SQUAL") as the base to measure service quality in Southern Railway.

The two main dimensions are: 1.Passenger amenities and 2.Service operational activities. To have a realistic approach, the first main dimension was subdivided into three sub dimensions, namely, (a) Basic amenities; (b) modern (tech driven) amenities and (c) Ticket booking facilities. The other main dimension, i.e., service performance activities does not have any subdivision. Thus ultimately, the gap analysis- mean analysis was used to measure the four dimensions of service quality in Madurai division of SR.

Reliability Test of Service Quality Dimension/Constructs

According to Bruce Thompson (2002) reliability refers to the extent to which a scale produces consistent result if repeated measurements are made. Cronbach's alpha is the most widely used measure of reliability, used as a lower bound estimate of the reliability of the constructs. George and Mallery (2003) provide the following rules of thumb: ≥. 8 is good; ≥.7 is acceptable; and ≥. 6 are questionable. There are four dimensions of service quality: 'Basic amenities' have 10 attributes/variables such as drinking water facility in the station, toilet facility, lighting and fans,

platform shelters, cleanliness in the station and coaches, seating facilities, foot over bridge facility, trolley path facility, adequacy of parking space, and availability of autos and public transport buses.

'Modern Amenities' encompasses six attributes such as touch screen facility, coach indication board, mobile phone charger facility, display of name chart in reserved coaches, escalator facility and Wi-Fi facility. Ticket booking facilities have five attributes such as online booking, booking facility in advance, seasonal ticket facility, ticket cancellation, and Tatkal scheme booking facility.

'Service operational activities' include eight attributes such as passenger fare, safety in journey, service frequency, punctuality in service, connectivity of trains, announcements about train timings, running of semi high speed trains and cooperativeness of railway staffs. Table 2 presents a summary of reliability statistics (Cronbach's alpha) run on SPSS.

Table 2 Summary of Reliability Statistics

S.No.	Dimension	No.of items in the dimension	Cronbach's alpha	
			Perception (Experience)	Expectation (Importance)
1	Basic amenities	10	0.823	0.847
2	Modern amenities	6	0.814	0.758
3	Ticket booking facilities	5	0.811	0.719
4	Service operational activities	8	0.861	0.859

Source: Primary data, Results calculated by author

A notable feature is that all the four dimensions have a value more than 0.7 and most are above 0.8 in passengers' perception and expectations of service quality of Madurai division in SR. It indicates that the scale items have good internal consistency. Further, the validity of the scale was tested by content validity by contacting the experts in the field.

The last but the most important step before performing gap analysis is testing the validity of the four dimensions/ constructs. The construct validity was carried out with confirmatory factor analysis (CFA). Performance of CFA revealed that all the 29 attributes/items were highly aligned with their corresponding dimensions. As the validity of dimensions was confirmed, the researcher proceeded to perform gap analysis through mean analysis.

Gap Analysis-Mean Analysis
The R-SQUAL model is the right choice to find the perception and expectation of passengers. This model would show the service quality gap in the service provided by the SR. Certainly, the gap may be positive or negative. Gap analysis is the difference/gap between passengers' (numbering 434) perceived mean and their expected mean for the 29 attributes/items under the four broad dimensions/constructs. A positive gap value would show that the passengers' actual experience/perception is more than expectation, indicating good service (that attribute doesn't require improvement). A negative gap value denotes the passengers' experience is less than their expectation, indicating not a good/poor service (that attribute requires improvement by the Southern Railway). Both perceptions and expectations of passengers for the 29 service quality attributes subject to four dimensions were measured with a 5 point numerical scale to rate their level of perception/expectation. The expectation score one denotes very low level of expectation and 5 is very high level of expectation. For the perception, score1 is very low level of service quality experience and 5 denotes very high level of service quality experience. Service quality gap values are the difference between the passengers' perception and expectation scores

(P-E). The quality score measures the service quality gap or the extent to which expectations exceed perceptions. The more positive the P-E scores, the higher level of service quality received by the rail passengers, and vice versa. The details of the result of service gaps in all the 29 attributes under the four dimensions are presented in table 3.

Table 3 Gap Analysis with Paired Sample T-Test

S.No	Service quality dimensions	Variables/Attributes	Expectation (E) (Importance)	Perception (P) (Experience)	Gap (P-E)	t-test	Sig.
		I Passenger Amenities					
SQ1	Basic Amenities	1. Drinking water facility in the station 2. Toilet facility in the station 3. Lighting & fans in the station 4. Shelters in the platforms 5. Cleanliness in station & coaches 6. Seating facility in the station & coaches 7. Foot over bridge facility in the station 8. Trolley path facility in the station 9. Adequacy of parking space & parking charge 10. Availability of auto & public transport buses	4.35 4.27 4.26 4.19 4.28 4.27 4.17 4.08 4.15 4.11	3.42 3.12 3.20 3.58 3.04 3.42 3.51 2.93 3.57 3.49	-0.93 -1.15 -1.06 -0.61 -1.24 -0.85 -0.66 -1.15 -0.58 -0.62	13.055 14.922 16.405 9.836 16.838 12.466 10.318 14.308 10.621 9.669	.000 .000 .000 .000 .000 .000 .000 .000 .000 .000
	Grand mean		4.213	3.328			
SQ2	Modern amenities	11. Touch screen facility in the station 12. Coach indication board in the station 13. Mobile phone charger facility in the station 14. Display of name chart in reserved coaches 15. Escalator & lift facility 16. WI-FI Facility	4.15 4.06 4.16 4.13 4.11 3.96	3.44 3.41 3.35 3.49 3.09 2.91	-0.71 -0.65 -0.81 -0.64 -1.02 -1.05	10.083 9.154 11.501 9.000 12.997 13.473	.000 .000 .000 .000 .000 .000
	Grand mean		4.095	3.280			
SQ3	Booking Facilities	17. Online booking facility 18. Booking ticket facility in advance 19. Season ticket facility 20. Ticket cancellation facility 21. Tatkal & premium tatkal schemes booking facility	4.11 4.15 4.13 4.14 4.03	3.73 3.66 3.59 3.42 3.32	-0.38 -0.49 -0.54 -0.72 -0.71	5.871 7.581 8.306 10.331 11.644	.000 .000 .000 .000 .000
	Grand mean		4.112	3.544			
SQ4	II Service	22. Passengers' fare	4.29	3.56	-0.73	12.056	.000

Operational Features	23. Safety in journey	4.30	3.23	-1.07	16.548	.000
	24. Frequency of service					
	25. Punctuality of service	4.19	3.39	-0.8-	12.890	.000
	26. Existence of connectivity of trains	4.25	2.97	-1.28	17.054	.000
	27. Announcements about train timing	4.17	3.31	-0.86	14.414	.000
	28. Running of semi high speed & high speed trains					
	29. Cooperativeness of staff	4.25	3.51	-0.74	12.615	.000
		4.18	3.20	-0.98	14.101	.000
		4.16	3.27	-0.89	13.306	.000
Grand mean		4.224	3.305			

p- Value <0.05

A striking disclosure of the above gap analysis is that there is a negative gap (grey area) in all the 29 variables of the four service quality dimensions of Southern Railway. It means the passengers' level of experience/perception of service quality lags behind their expected level of the service quality for all the 29 attributes of service quality of Southern Railway.

Another important revelation is that individual attribute rise, the negative gap is wider in the attributes cleanliness in station and coaches (-1.24), followed by toilet facility (-1.15), trolley path facility (-1.15), and lighting and fans (1.06) under the dimension basic facilities. Similarly, the negative gap is wider in the attributes Wi-Fi facility (-1.05), and escalator facility (-1.02), in the dimension modern amenities. One could also observe the negative gap is bigger in the attributes punctuality of train service (-1.28), followed by safety in journey (-1.07) under the dimension service operational activities of SR. Thus, the study has pinpointed the deep grey areas in the individual attributes under the broad dimensions of service quality indicating priorities for improvement by the IR/SR.

Significance Testing
Test of significance is made for each of the pairs of attributes of service quality under the four dimensions. The null hypothesis of no difference/gap between each pair of attributes is verified by paired t-test at 0.05significance level. If there is no difference between the means, it shows that the passengers' experiences or perceptions are exactly as expected, and so the null hypothesis is accepted; otherwise, the alternative hypothesis is accepted.

From the observance of probability in the last column of the above Table 3, one can conclude that there is a difference (negative gap) in the mean of the pairs of all the 29 attributes of service quality dimensions; it means all the null hypotheses are rejected. Similarly, the null hypothesis of grand mean for each pair of all the four dimensions is verified by paired t-test (vide Table 4)H_0: There is no difference between expectation and perception of passengers in terms of the dimension basic amenities in Madurai division Southern Railway zone (of IR). Similar null hypothesis was formulated for the other three broad dimensions of service quality.

Table 4 Pair Differences between Perception & Expectation in Sq
Dimensions of Southern Railway

Pair	Dimensions	Grand Mean value		Gap score (P-E)	Statistic	Sig.
		(P)	(E)			
Pair1	Basic Amenities Perceived-Basic amenities expected	3.328	4.213	-0.885	-54.328	.000
Pair2	Modern Amenities Perceived-Modern amenities expected	3.280	4.095	-0.815	-26.323	.000
Pair3	Booking facilities Perceived-Booking facilities expected	3.544	4.112	-0.568	-19.61	.002
Pair4	Service Operational features Perceived - Service Operational features Expected	3.305	4.224	-0.919	-41.263	.000

Source: Primary data

As the p-value 0.000 is far less than the significance 0.05, null hypothesis in terms of all the four broad dimensions are rejected. It means there are negative gaps in all the four pairs of dimensions of service quality of SR.

7.   Suggestion and Conclusion

A remarkable revelation is that grand mean difference is bigger in two dimensions, namely, service operational activities and basic amenities with the larger negative (grand mean) value of -0.919 and -0.885 respectively. At this juncture, it is noticeable that individual pair of attributes in the dimension basic amenities, namely, cleanliness and toilet facility has registered a bigger negative gap; similarly, the individual pairs of attributes in the broad dimension service operational activities, namely, punctuality in service and safety in rail journey have shown a larger negative gap. The Ministry of Indian Railway should ponder over these negative gaps.

The crux of the problem is how to close the negative gaps in the service quality of IR/SR? Now the Indian Railway/Southern Railway are at cross roads. It is caught in between Schilla and Charybdis. That is to say, amid dire financial straits, the IR/SR has to overcome the lacunae in its service quality. The real situation is this- there is fierce competition in surface transportation; now the rail passengers are craving for improved rail service. Being so, the pragmatic solution lies in augmenting the revenue of SR/IR from passenger traffic, so that the rail passengers' expectations of robust service would be fulfilled.

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