Impact of Service Quality Management (SQM) Practices on Indian Railways - A Study of South Central Railways

M. Devi Prasad (Corresponding author)

Research Scholar, School of Management Studies

University of Hyderabad, Hyderabad, India

Tel: 91- 40-2712-5085   E-mail: mdprasad1967 @ gmail.com

Dr. B. Raja Shekhar

Associate Professor, School of Management Studies

University of Hyderabad, Hyderabad, India

Tel: 91-40-2301-1363   E-mail: b_rajashekhar@ yahoo.com

Abstract

The main objective of this study is to present a framework developed for assisting Railways to monitor and control the quality of services provided to passengers. The study evaluated the passenger Rail Service quality of Indian Railways by developing SQM (Service Quality Management) model on the basis of SERVQUAL and Rail Transport quality. Three new dimensions (Service Product, Social Responsibility and service delivery) are added to the original five SERVQUAL dimensions (i.e. assurance, empathy, reliability, responsiveness and tangibles). The instrument is tested for reliability and validity. Empirical study was conducted at Secunderabad Railway station of South Central Railway, India, using a purposive sample of 200 respondents. Valid responses from the questionnaire are statistically analyzed by using factor analysis. This research has also identified the order of importance for these eight factors, for example service delivery and social responsibility are identified as the most important and the least important factors respectively. This study would help the Railways to monitor, control and improve the service.

Keywords: Railway Service quality, Indian railways

1. Introduction

Service quality is the decisive factor for any service organization to create the difference and obtain competitive advantage. Evaluation of service quality of Railways may give the true picture about the short comings in Railway passenger service. Quality changes the nature of business competition and, perhaps more than any other factor, it dictated how companies make products or deliver services. In the global economy quality is just the entry ticket. It is recognized that high quality service is essential for organizations that want to be successful in their business (Parasuraman et al 1988; Rust and Oliver, 1994). The organization has to battle many competitors who have attained it. The next step is figuring out how to differentiate you. This differentiating and improving is possible only through service quality measurement. In general, research articles on service quality addresses two types of problems i.e, *instrument for measuring service quality* and *evaluation of service quality*. It is highly desirable to incorporate both problems in a comprehensive manner. To this end, a conceptual general methodology for measuring and evaluating the service quality has been proposed. While there are a number of studies on rail passenger service quality (eg.Disney, 1988, 1999; Hann and Drea 1998; Drea and Hanna 2000; Tripp and Drea 2002), there is very little published literature that reports the use of SERVQUAL in the assessment of railway passenger service quality.

To understand service quality there are an array of factors or determinants. A number of researchers have provided lists of quality determinants, but the best known determinants emanate from Parasuraman and colleagues from USA, who found five dimensions of service quality ,namely tangibles, reliability, responsiveness, assurance and empathy and used these as the basis for their service quality measurement instrument , SERVQUAL (Parasuraman et al 1988; Zeithaml et al., 1990). The result was the development of SERVQUAL instrument based on the gap model. The central idea in this model is that service quality is a function of the difference scores or gaps between expectations and perceptions. An important advantage of the SERVQUAL instrument is that it has been proven valid and reliable across a large range of service contexts.

However, while the SERVQUAL instrument has been widely used, it has been subjected to certain criticisms as well. It has been suggested that for some services the SERVQUAL instrument needs considerable adaptation (Dabholkar et al ., 1996) and that items used to measure service quality should reflect the specific service setting under investigation, and that it is necessary in this regard to modify some of the items and add or delete items as required (Carman,1990) .

2. Service Quality Management (SQM) in Indian Railways

Allen and DiCesare (1976) considered that quality of service for public transport industry contained two categories: user and non – user categories. Under the user category, it consists of speed, reliability, comfort, convenience, safety, special services and innovations. For the non –user category, it is composed of system efficiency, pollution and demand. Sillock (1981) conceptualized service quality for pubic transport industry as the measures of accessibility, reliability, comfort, convenience and safety. Traditionally, the performance indicators for public transport are divided into two categories: efficiency and effectiveness. Under the efficiency category, the measures are concerned with the process that produce the services while the effectiveness category are used to determine how well the services provided are with respect to the objectives that are set for them (Pullen,1993). The gap model of service quality and concept of transport service quality showed that service quality should be measured on multidimensional basis. SERVQUAL is much more humanistic, or customer-related, while most of the measures used in public transport industry are much more mechanistic, or have technical focus, or use more objective measures. In summary, in order to measure the quality of service thoroughly, the attributes used in SERVQUAL, the public transport industry and the railway service sector should be grouped together to form a pool of items for measurement. Hence we have modified the attributes in the SERVQUAL model and added three new dimensions namely, Service product, Social Responsibility and Service Delivery for the development of SCM model for the measurement of Railway passenger Services. We conducted the research to assess the service quality of railway passenger service by identifying customer perceived gaps.

The Indian Railways (IR), more than 150 years old, is among one of the largest and oldest systems in the world, fondly called by railway persons as the 'Lifeline of the Nation'. With an extensive network spread across the country, Indian Railways plays a key role in the social and economic development of India. IR is a principal mode of transportation for long haul freight movement in bulk, long distance passenger traffic, and mass rapid transit in suburban area. It occupies a unique position in the socio-economic map of the country and is considered as a vehicle and barometer of growth. It is also the biggest state-owned enterprise in India, and contributes about 1% of India's Gross Domestic Product (GNP) (White Paper on IR). Indian Railways, on one hand is seen as a government department with mandatory service obligations and on the other, is expected to function as a commercial organization, financially self sufficient. Its passenger services, long distance as well as urban transport, continue to be heavily subsidized. Populism rather than business objectives continue to guide and determine the key investment decisions and new services of IR. IR provides the most energy efficient and economical mode of transportation in India. In spite of this, IR lost its market share in Freight and Passenger segment due to lack of customer responsiveness and poor public perception. Passenger service constitutes 60% of the transport output but contribute only 32% of the revenue. 60% of the suburban passenger traffic adds only 10% to the passenger earnings (Raghuram). The upper class travelers - though comprise only 1% of the originating passengers - account for around 20% of passenger revenues. The ratio of average passenger fares per passenger kilometer (pomp) to average freight tariffs per net ton (tom) is very low in IR compared with other countries. The ratio of 0.3 for India compares with 1.2 in China, 2.2 in Japan, 0.7 in Thailand and 0.5 in Bangladesh. In passenger segment IR share is 68% in the year 1951 to roads 32% where as it is a mere 13% share in a total of 87% for Roadways now (ADB report on IR). As of now, many academicians and practitioners have undertaken various works on other areas of management on Indian Railways but very limited work has been done in Service operations management (Shainesh and Mukul). The study will examine the service quality measurement in various services of IR.

3. Research Methodology

3.1 Objective of the Study

The Study was aimed at finding out the following.

> ➢ What is the passenger satisfaction factor in railways?

> ➢ What does the item of service quality that lead to passenger satisfaction?

> ➢ How to deliver the item of service quality that lead to passenger satisfaction?

> ➤ What is the extent of gap between passengers' expectations and perceptions?

The objective of this research is to develop an instrument which will help the Indian Railways measure service quality of various divisions and Zones to monitor and improve its service, and increase competitiveness.

3.2 Study Methods

The study followed the research accomplishments at home and abroad as its basis, especially referring to the dimension categories and variables design in Zeithmal and others' SERVQUAL model and aiming at the railway passenger service. Based on the dimensions, we designed the questionnaire. Used Cronbach's alpha, Item-to-total correlation and factor analysis methods to carry out scale purification. Finally we evaluated the reliability and validity of the questionnaire.

3.3 The selection and definition of variables

The study aims at evaluating the railway passenger's service quality by referring to Zeithmal and others' SERVQUAL model, which is a universal model and contains the common elements. However, specifically regarding to railway passenger service, it should be adjusted accordingly. Through the interviews with some passengers, railway officers we established 38 attributes about passenger's evaluation of railway passengers service quality based on the eight service elements. Three new dimensions (service product, social Responsibility and service delivery) are added to the original five SERVQUAL dimensions (i.e. assurance, empathy, reliability, responsiveness and tangibles).

3.4 Samples

The survey takes the form of randomly selected respondents at the Secunderabad Railway Station of South Central Railway, India. The Survey took place in January 2010. Among a total of 240 questionnaires 224 questionnaires were valid. The valid rate of questionnaire is 80%. Samples characteristics are as follows: men accounted for 60.71 % and women 39.29. %. Age below 18 accounted for 14.29 %, 19-30 accounted for 22.32 %, 30-60 accounted for 35.71 % and older than 60 accounted for 27.68%. Education background, 23.21. % of under graduation, Graduates accounted for 46.43 % and Post Graduates and above accounted for 30.36 %. Income level per annum less than 1.5 Lakhs accounted for 11.6%, 1.5 – 3 lakhs accounted for 21.43 %, 3-5 lakhs accounted for 41.07% and above 5 lakhs accounted for 25.89 %.

3.5 Scale purification of indicators

Referring to Zeithmal and others' way, we simplified the questionnaire by using Cronbach's Alpha, Item – total correlation, factor analysis and other methods. The first step of scale purification is to calculate item to total correlation items and delete some of them whose scores is below 0.4. After analyzing item-to-total correlation for three times we excluded attributes Q3, Q7, Q11, Q16, Q23, Q27.The second step is to analyze factor. We used a principal component analysis and deleted factor load which are less than 0.5 or the attributes whose two factors are all more than 0.5.We found that the items Q9, Q13, Q20, Q28, Q33, Q38 have to be deleted because their results of factor analysis are less than 0.5.We did the factor analysis on the remaining 26 items again. The results are shown in the table II .From the table it can be found that all the attributes' factor loadings are reasonable and we extracted 8 factors from them. In total 12of the initial 38 attributes were deleted. This intensity of the attributes deletion is not exceptional in scale development studies as the final scale may even contain one fifth of the original items (Bienstock et al., 1997)

Following is the attributes included in the eight factors as well as their meanings.

Factor 1. "Tangibles". It included Q19, Q21, Q22, Q24.Thease four attributes have higher loading. Factor 1 can be described as the indicator to measure whether railway is giving importance to cleanliness of the station, staff and train. Factor 2. "Reliability". It included Q14, Q12, Q10. These three items are all from factor 2 which includes running trains punctually, providing services as promised and passenger friendly attitude. It represents the ability of railways to fulfill the service they promise. Factor 3 "Assurance". It included Q5, Q3, Q4, Q1.This dimension mainly takes care of courtesy of staff and assurance of journey. Factor 4 "Responsiveness" which included Q18, Q15 and Q17 which talks about willingness to help and prompt service. Factor 5 "Empathy" which includes Q6, Q 8 which deals about human touch in relations like dealing in caring fashion, having passenger best interest in heart etc. Factor 6 "SOCIAL RESPONSIBILITY" which includes Q31, Q32, Q34, and Q35 which is talks Railways commitment towards social obligations. Factor 7 "SERVICE PRODUCT" which includes Q26, Q29, Q25, Q30 which is about food facility, medical facility, availability of seats etc in the journey. Factor 8 includes Q36 and Q37 which deals with overall journey time and about maintaining punctuality.

3.6 Reliability and validity test

After finishing the railway passenger quality evaluation model, we have to test its reliability and validity. In reliability test, the study uses Cronbachs' Alpha Coefficients as the test standard to observe the consistency of internal attributes in the model. The coefficient is 0.795 got from the test, which showed the attributes in the model are very ideal. In validity test, the study uses the exploratory factor analysis. Test results showed that the common degrees of attributes in the model are all above 0.51.Because of the common degree is the significant sign to evaluate structural validity of the evaluation model. So the validity of the model is accepted.

3.7 Computation and analysis of Rail Passenger service quality

The study refers to the way of calculating the gap of passengers' perception and expectation in SERVQUAL Model. In SERVQUAL model, the attributes of service quality are considered equal to be calculated. The expression of evaluation model is as follows:

$$SQ = \sum_{i=1}^{n} (Pi - Ei)$$

In the expression

SQ – Scores of perception of service quality

Pi - Scores of perception of indicator I

Ei   - Scores of expectation of indicator I

Then, add all the scores in the sample in order to get arithmetic average scores, which is called the average score of service quality

$$AVSQ = \frac{\sum_{i=1}^{n} (Pi - Ei)}{N}$$

In the expression AVSQ --- Average score of service quality

SQi   --- Perception of service quality of passenger I

N --- Total numbers in sample.

By using the two above formulas, we can calculate and get the evaluation scores of the service quality. Here, in order to facilitate the calculation and analyze the outcome, we first calculated average of each dimension. Then we calculated customer perceived service quality score. To easily analyze, a detailed dimensions and their respective attributes are listed as shown in table III. After calculating, the average score of perceived quality is: AVSQ= -1.4431. This is the passengers' evaluation score of service quality. We can get the following conclusions from the results.

(1) The overall average score (-1.4431) reflects that railway transport service does not meet passengers' expectations. That is, Railway passengers are not satisfied in the course of interaction with rail passengers.

(2) Scores of the dimensions in Table III show that Social Responsibility, Responsiveness, assurance get higher scores. This means that passenger's perception on Social Responsibility, Responsiveness, and assurance is much higher than other aspects.

(3) Service Delivery, Reliability and Empathy gets the lowest score among these dimensions which means that passengers are not happy with railways punctuality and staff behavior in general. This needs to be taken care by railways.

(4) All in all, service quality gets the comparatively low scores among the eight dimensions of rail passenger service quality. So, it is necessary to do a comprehensive adjustment and improve the service quality to meet passengers demand.

4. Conclusion

Improving the quality of service is one of the ways to improve the competitiveness of Railway Passenger Business. In all the trains and at stations the above questionnaire can be used for collecting the feedback from passengers. The results point towards the need for South Central Railway to formulate management policies such

as training of staff so that Staff will be more responsive to customers needs. Bureaucracy in SCR has to be reduced or eliminated as it's a government department with less dynamism. Hence the human touch is more required as we can see in Airlines services which we are missing in Indian Railway Passenger Services. If this aspect is improved there will be definitely improvement in the satisfaction levels of the Passengers. The Service Quality and service process are interesting subjects to be analyzed and discuss not only in business but also in transportation area, as the results can give benefit for the management. We will be able to know the inside process to set effective and efficient improvement in service which leads ultimately to passengers satisfaction.

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Table 1. Attributes generated for the Study

Dimensions	Numbers	Attributes
Assurance	5	Q1.Courtesy of staff on train
		Q2. Being informed if there are delays
		Q3.Staff at ticket office
		Q4.Staff having knowledge to answer your questions.
		Q5.Providing you with information about any changes in itinerary.
Empathy	4	Q6.Understanding your needs when you make inquiries
		Q7. Having your best interest at heart.
		Q8 Availability of coach attendant/helper in the train
		Q9. Availability of Carriers (Coolie and trolley)
Reliability	5	Q10. Maintaining the frequency of trains as scheduled
		Q11. Providing on time train services
		Q12.Depandability in handling your service problems'
		Q13. Updated information about status of train during travel
		Q14 Complaint Handling System
Responsiveness	4	Q15.Willingness to help you
		Q16.Promt service
		Q17. Availability of staff in handling requests
		Q18. Dealing with you in caring fashion when you make inquiries
Tangibles	6	Q19. Clarity of information given in timetables
		Q20.Clarity of information given at stations
		Q21.Cleanliness of the station
		Q22. Cleanliness of train
		Q23.Overall appearance of the train
		Q24. A neat professional staff
Service product	6	Q25 Availability of seating in train
		Q26.Modern appearance of Station
		Q27 Comfortable temperature in the train
		Q28. Smoothness of ride of the train
		Q29. Food facility in the train
		Q30. Medical facility in the train
Social Responsibility	5	Q31.Personal safety at stations.
		Q32. Personal safety on train
		Q33 Railways provides excellent service to customers
		Q34 Railways makes a lot of contribution to society
		Q35.Railways provides affordable travel to all the sections of society
Service Delivery	3	Q36. Traveling time of the trains are reasonable
		Q37. Punctuality of trains is well maintained.
		Q38.Rail Journey is comfortable

Table 2. The Result of the Second factor Analysis

Attributes	Factors (i.e. Dimensions)							
	1	2	3	4	5	6	7	8
Q19	0.807							
Q21	0.814							
Q22	0.794							
Q24	0.785							
Q14		0.807						
Q12		0.715						
Q10		0.681						
Q5			0.846					
Q2			0.735					
Q4			0.615					
Q1			0.525					
Q18				0.826				
Q15				0.737				
Q17				0.685				
Q6					0.739			
Q8					0.564			
Q31						0.785		
Q32						0.646		
Q34						0.595		
Q35						0.515		
Q26							0.921	
Q29							0.826	
Q25							0.749	
Q30							0.648	
Q36								0.857
Q37								0.756

Table 3. Dimension Score and the Total Average Score

Dimensions	Attribute Number		Average Gap	Dimension Score	Total Average Score
	Old	New			
Tangibility	Q19	1	- 1.56	-1.7325	
	Q21	2	- 1.88		
	Q22	3	-1.52		
	Q24	4	- 1.97		
Reliability	Q14	5	-2.01	-1.7533	
	Q12	6	-1.50		
	Q10	7	-1.75		
Assurance	Q5	8	-1.42	-1.5625	
	Q2	9	-1.67		
	Q4	10	-1.85		
	Q1	11	-1.31		
Responsiveness	Q18	12	-1.51	-1.5766	-1.4431
	Q15	13	-1.69		
	Q17	14	-1.53		
Empathy	Q6	15	-1.97	-1.8650	
	Q8	16	-1.76		
Service Product	Q31	17	-1.45	-1.6575	
	Q32	18	-1.73		
	Q34	19	-1.82		
	Q35	20	-1.65		
Social Responsibility	Q26	21	-1.45	-1.3975	
	Q29	22	-1.26		
	Q25	23	-1.31		
	Q30	24	-1.57		
Service Delivery	Q36	25	-2.21	-2.3650	
	Q37	26	-2.52		