

Service Quality of South Indian Railway- Determinants of Passenger Satisfaction in Trains.

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ABSTRACT: *Passenger (Customer) satisfaction of Indian railways has highly influenced on its service quality. Various authors have described a number of dimensions regarding the service quality of Indian Railway. This study identifies factors of service quality of Indian Railways in the train. The study is exploratory in nature and used factor analysis to identify the most and least important factors of customer satisfaction on service quality. The research methodology is empirical, and a survey of passengers (customers) was conducted. This study considered seven factors and 16 variables to analyze the passenger satisfaction. The study analyzed reliability Coefficient, Eigen Value and components Correlation Matrix etc. The findings of this study reveals that the most important factors determining satisfaction of passengers in train are serially comes as basic facilities, hygiene , safety & security, catering , health care service, punctuality, behavior towards passengers.*

Keywords: *South Indian Railway, Passenger satisfaction, Service quality, Satisfaction model.*

I. INTRODUCTION

Raghuram and Rachana Gangwar [1] describes the Indian Railways (IR) is among one of the largest and oldest rail transportation systems in the world, more than 150 years old, fondly called by people 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 . A study on railway passenger service quality valuation carried out from December 1999 to June 2000 by the organization named Steer Davies Gleave [2] of London prepared for Shadow Strategic Rail Authority to study the importance of rail passengers into improvement of the range and quality of facilities and service on stations and in trains. Service quality may be defined as customer perception of how well a service meets or exceeds their expectations. Satisfaction from service quality is usually evaluated in terms of technical quality and functional quality. Czepiel, J.A [3] usually, customers do not have much information about the technical aspects of a service; therefore, functional quality becomes the major factor from which to form perceptions of service quality. This paper is an attempt to put forth the role of service quality in affecting customer satisfaction in the train, with special reference to South Indian Railways.

II. LITERATURE REVIEW

In this study the researcher tried to go through various literature reviews on the customer satisfaction. Parasuraman , A. Zeithamal, V. A. & Berry, L. L. (1985). [4] Identified 10 key determinants of service quality as perceived by the service provider and the consumer, namely, reliability, responsiveness, competence, access, courtesy, communication, credibility, security, understanding/ knowing the customer, and tangibility to formulate a service quality framework, *SERVQUAL*. Later (in 1988), they modified the framework to five determinants: reliability, assurance, tangibles, empathy, and responsiveness, or *RATER*. Rust & Oliver 1994 [5] further defined satisfaction as the "customers' fulfillment response", which is an evaluation as well as an emotion-based response to a service. They also assessed service satisfaction using items that include interest, enjoyment, surprise, wise choice and doing the right things. J. D. Power and Associates [6] measured overall customer satisfaction of electric utilities through six factors: power quality and reliability, customer service, company image, billing and payment, price, and communications. J. D. Power and Associates [7] also measured customer satisfaction with high-speed and dialup Internet service providers based on five factors: performance and reliability cost of service, customer service, billing, and offerings and promotions. In another study, J. D. Power and Associates [8] found communication (information systems) to be a determinant of customer satisfaction for customers of utility companies. Vanniarajan and Stephen [9] identified the attributes that passengers use to evaluate the service quality of Indian Railways as reliability, assurance, empathy, tangibles,

and responsiveness. It was found that passengers were “moderately satisfied” to “satisfied” on these dimensions. Ying Peng, Wan Rosmanira Ismail, Nur Riza Suradi, Zainol Mustafa, Zalina Mohd Ali, Rofizah Mohammad & Faridatulazna Ahmad [10] for service providers, customer satisfaction is crucial to know which service attributes add value and increase satisfaction, which of them merely fulfill minimum requirements and minimum dissatisfactions and which do both. Geethika Shefali Nandan , [11] it is considered as a key factor for enhancing customer satisfaction .Cronin, J.J & Taylor (1992), [12] even the study of found it a key antecedent to customer satisfaction. Grzanic, J, (2007), [13] Service quality not only play vital role to satisfy customers. Kaul. S, (2005) [14] but also considered as a value driven for consumers and a way to position product in a dynamic environment. Shahin, A. (2002), [15] Understanding the customers’ requirement about the service quality and catering the need in this regard is beneficial in many ways.

III. AIMS AND OBJECTIVES

The study aims to identify factors which the Indian Railway provided for the passengers in train. Hence the basic objective of this study is to identify the factors determining the service quality of the Indian Railways in train service that leads to the customer satisfaction. The customer satisfaction has been commonly accepted as indicator of the service.

IV. RESEARCH DESIGN

This research is diagnostic in nature statistical method applied to analyze the research objectives. The following literature review clearly indicates that many of Indian Railways services are important for customer satisfaction. Moreover, a study on the service quality of in train services and level of customer satisfaction derived from in train services has been ignored by researchers in the Indian context. Hence, an attempt is made to study customer perception of quality of Indian Railways in train service. In this study, the researcher adopted survey to identify the determinants of customer satisfaction with this very important public utility in the special context of India

IV. MATERIALS AND METHODS

This study explores a relation between railway service quality factors and customer satisfaction based on passenger perception. A model is developed which describe the relationship between overall satisfaction of service and the service attributes in different circumstances of passenger perspectives. For the purpose of the study, the survey was conducted at significant railway stations at Chennai, Trivandrum etc. in South India. In addition to this, the researcher made train journey and contacted passengers. The survey was lasted with 55 days and a total of 500 passengers both in train and those got off from train also contacted .The questionnaire set with comprising of 7 factors and each factor again divided into two to four with total of 16 variables and distributed to 500 passengers to get their response rate on five point scale. A total number of 437 questionnaires were retrieved, (response rate 87.4%) and 63 were not responded (non response rate (12.6%). The validity of data was examined with Kaiser-Mayer-Ohlin measure of sample adequacy and Bartlett’s test of spherical and result has shown valid.

In this study, 7 factors along with 16 variables were analyzed. The reliability coefficient of each factor and its variables each are also analyzed. The most important factor determines the satisfaction of passengers in train was found to be basic facilities. Under this factor, each variable with Eigen value and reliability coefficient also analyzed.

The sample in this study, it may not represent the entire population who made use of train journey. While making the sample, the researcher, has taken care to test the significance so as to ensure the sample size would not affect the result of this study.

Indian Railways is the largest rail network in Asia and the world’s second largest under one management. It is a multi-gauge, multi-traction system covering 108,706 kilometers, with 6,853 stations across the length and breadth of the country. It runs 11,000 trains, of which 7,000 are passenger trains that carry 13 million passengers every day. It is the largest employer in the organized sector in India, with a workforce of 1.54 million. (www.indianrailway.gov.in).

For administrative purposes, Indian Railways is divided into 17 zones. **Southern Railway**, one of its zones, came into existence on 14th April 1951 through the merger of the three state railways namely Madras and Southern Mahratta Railway, the South Indian Railway, and the Mysore state railway. Southern Railway's present network extends over a large area of India's Southern Peninsula, covering the states of Tamil Nadu, Kerala, Pondicherry, and a small portion of Andhra Pradesh. Serving these naturally plentiful and culturally rich southern states, the Southern Railway extends from Mangalore on the west coast and Kanniyakumari in the south to Renigunta in the North West and Gudur in the North East. (www.indianrailway.gov.in) Headquartered

at Chennai, the Southern Railway comprises of the following six divisions.(1). Chennai (2). Tiruchirapalli (3). Madurai (4). Palghat (5). Trivandrum (6). Salem

In this study, questionnaire included 16 variable to measure the in train passenger satisfaction from the service quality provide by the Indian Railways. They are follows.

- Availability of Seats
- Drinking Water
- Power Supply
- Sanitation Quality
- Neatness of Compartment
- Presence of Creatures & Insects
- Self Safety
- Safety of Belongings
- Affordability
- Quality
- Medical Service
- Availability of Doctors
- Right-time Service
- Information Accessibility
- Behavior of Staff
- Behavior of co-passengers

V. ANALYSIS AND DATA INTERPRETATION

Nhat and Hau (2007) identified the determinants of retail service quality using factor analysis. The same tool was used by Hsu et al. (www.academic-papers.org) and Agrawal (2008) to identify determinants of customer satisfaction on internet shopping. The same method was used here to identify the factors determining customer (passenger) satisfaction. Factor analysis was done to identify the factors determining passenger satisfaction and to test the hypothesis formulated regarding the factors determining passenger satisfaction. Data were analyzed using SPSS 19.0 software.

The test of validity of data was examined with the help of a Kaiser-Meyer-Ohlin (KMO) measure of sample adequacy and Barlett's test of sphericity. Taken together, these tests provide a minimum standard which should be passed before a factor analysis should be conducted. These two tests satisfied the validity of data for factor analysis from the table I.

Table I: Kaiser-Meyer-Ohlin Measure and Bartlett's Test

KMO Measure of Sampling Adequacy	0.508	
Bartlett's Test of Sphericity	Chi-Square	3926
	df	120
	Sig.	0.000

The factor analysis resulted in seven factors; basic facilities, hygiene, safety & security, catering, health care service, punctuality and behavior towards passengers. The factor loading of the variables determining satisfaction in each factor, the reliability coefficient (Cronbach alpha), the Eigen value, and the percent of variation explained by the factors are shown in table II.

The most important factor determining satisfaction was found to be basic facilities since the Eigen value and percent of variation explained by this factor are 3.872 and 24.202 respectively. This factor consists of three variables with a reliability coefficient of 0.774. It shows that the included variables explain this factor to the extent of 77.4 and the percent variation explained by this factor is 30.4 percent.

The next factor identified is hygiene. Its respective Eigen values and percent of variation explained are 2.089 and 13.55. This factor consists of three variables with reliability coefficients of 0.611. The next two factors identified are safety & security and catering. Their respective Eigen values are 1.879 and 1.534. Each of these factors consists of two variables with reliability coefficients of 0.519 and 0.530 each. The percent variations explained by these factors are 11.741 and 9.588, respectively.

The other three factors determining passenger satisfaction as identified by factor analysis are health care service, punctuality and behavior towards passengers with two variables each, and with reliability coefficients of 0.778, 0.206 and 0.424 respectively. The percent variations explained by these factors are 9.494, 6.848 and 5.410 respectively.

Table II: Factor Loading and Reliability Coefficient.

Factors	Variables	Factor Loading	Reliability Coefficient	Eigen Value	% of Variation Explained
Basic Facilities	Availability of Seats	0.752	0.774	3.872	24.202
	Drinking Water	0.913			
	Power Supply	0.853			
Hygiene	Sanitation Quality	0.665	0.611	2.089	13.055
	Neatness of Compartment	0.715			
	Presence of Creatures & Insects	0.838			
Safety and Security	Self Safety	0.803	0.519	1.879	11.741
	Safety of Belongings	0.710			
Catering	Affordability	0.829	0.530	1.534	9.588
	Quality	0.787			
Health Care Service	Medical Service	0.602	0.778	1.519	9.494
	Availability of Doctors	0.928			
Punctuality	Right-time Service	0.792	0.206	1.096	6.848
	Information Accessibility	0.721			
Behavior towards Passengers	Behavior of Staff	0.673	0.424	0.866	5.410
	Behavior of co-passengers	0.850			

Extraction Method: Principle Component Analysis

Rotation Method: Promax with Kaiser Normalization.

As evident from Table 4, there is a low correlation between different factors, the maximum being 0.466 (between the factors “behavior towards passengers” and “security”). This means that all the five factors are independent, which implies that they are measuring unrelated dimensions.

Table III: Component Correlation Matrix

Component	Basic Facilities	Hygiene	Safety & Security	Catering	Health Care Service	Punctuality	Behavior towards Passengers
Basic Facilities	1.000	0.196	-0.161	0.235	-0.234	0.162	0.310
Hygiene	0.196	1.000	-0.351	0.168	-0.019	-0.192	-0.015
Safety and Security	-0.161	-0.351	1.000	0.002	-0.103	0.294	-0.020
Catering	0.235	0.168	0.002	1.000	0.020	-0.044	-0.030
Health Care Service	-0.234	-0.019	-0.103	0.020	1.000	-0.003	0.075
Punctuality	0.162	-0.192	0.294	-0.044	-0.003	1.000	0.201
Behavior towards Passengers	0.310	-0.015	-0.020	-0.030	0.075	0.201	1.000

Extraction Method: Principle Component Analysis

Rotation Method: Promax with Kaiser Normalization

The results provide statistical evidence to support identified determinants of customer satisfaction as Basic facilities, Hygiene, Safety & Security, Catering, Health care service, Punctuality and Behavior towards passengers.

- *Basic Facilities*: This aspect includes the availability of seats, drinking water and power supply. Passengers consider basic facilities as the most important aspect of satisfaction.
- *Hygiene*: This includes sanitation quality, neatness of compartment and presence of creatures and insects. Hygiene is the second important determinant of customer satisfaction.
- *Safety and Security*: This refers to self safety and safety of belongings. Passengers consider safety and security is the third important determinant of satisfaction.

- *Catering*: This consist of affordability and quality of catering items. Catering is the fourth important determinant of customer satisfaction.
- *Health Care Service*: This refers to the medical service and availability of doctors. Safety and security is the fifth important determinant of customer satisfaction.
- *Punctuality*: This refers to right time service and information accessibility. Punctuality is the sixth most important determinant of customer satisfaction.
- *Behavior towards Passengers*: This includes behavior of staff and behavior of co-passengers. Behavior towards passengers is the least important determinant of customer satisfaction.

VII. CUSTOMER SATISFACTION MODEL

Based on the statistical methods of factor analysis a model of passenger satisfaction in train is proposed. In this model, customer satisfaction is dependent variable and the five factors- basic facilities, hygiene, catering, health care, punctuality are independent variables

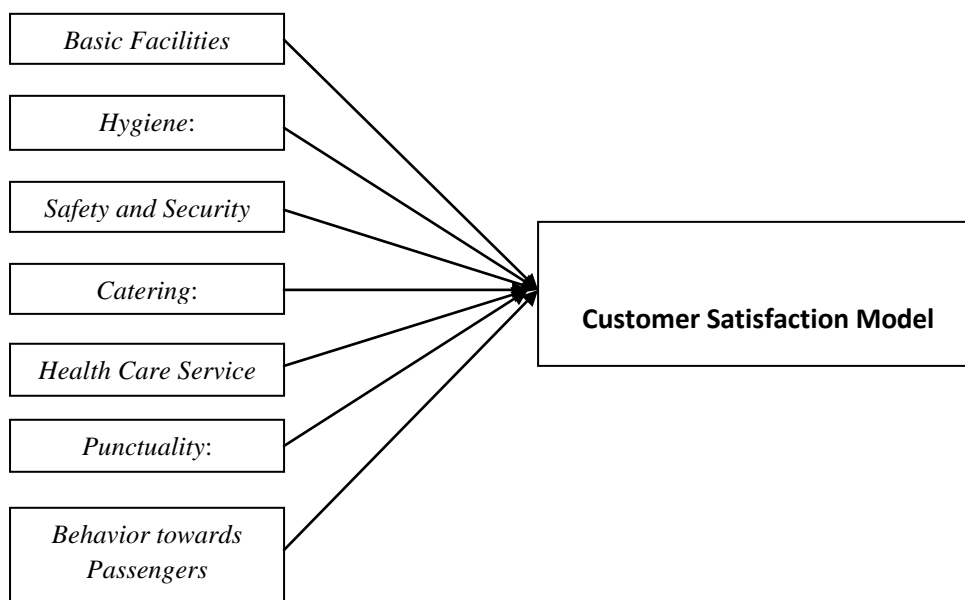


Figure. 1. Customer satisfaction model

VIII. RESULTS OF THE STUDY

- *Basic facilities*: the result provided from the statistical analysis supported that the determinant of safety and security is most important factor to determine the satisfaction of the customer. (The variables are Availability of seats, Drinking water and Power supply).
- *Hygiene* in the train is second important factor came under the satisfaction level of the customer. (This includes sanitation quality, neatness of compartment and presence of creatures and insects).
- *3. Behavior towards passengers* is least important factor to determine the satisfaction level of the customers (passengers)
- A passenger (customer) satisfaction model could be availed on the basis of factor analysis.

IX. SUGGESTIONS

- Comprehensive attempt to implement the qualified services to the customers.
- Implement effective and far reaching service quality model.
- Focus on vital service quality factors like Basic facilities, Hygiene and Safety- Security, which are considered paramount factors as far as concerned to the in train passengers.
- Since the basic facilities and hygiene are important factors to determine the satisfaction of the customers, the Railways are to pay more attention to provide such services.
- The designed satisfaction model can be either developed or to be modified so as to ensure better and qualified services and overall satisfaction to the customers (Passengers) while in the train journey.
- A comprehensive study with an attempt to collect the factors along with all relevant variables so as to get the overall satisfaction level of the customers on service quality.

X. LIMITATION OF THE STUDY

- The factors determine the satisfaction of passengers on Railways service quality is large in number. In this sense, the selection of limited variables in this study not at all ensures comprehensive result towards the satisfaction of the passengers.

XI. CONCLUSION

The empirical nature of this study is really a contribution to identify the factors that determine passenger satisfaction in train with service quality of services provided by the Indian Railways. The determinants that mostly affect the satisfaction of passengers (customers) in rank order is Basic facilities, Hygiene, Safety & Security, Catering, Health Care Service, Punctuality, and lastly and the least important factor is Behavior towards Passengers. The Indian Rail transportation is gaining importance day by day. With the increase of passengers, the Indian Railways has focused to extend its attention to satisfy the needs of customers and made initiatives to improve the quality of service to enrich the satisfaction of customers. Even though repeated attempt made by the Railways to improve the quality of services, the result would not satisfied the customers (passengers) needs. It reveals that, continuous, comprehensive, lengthy intentional performance and attempts are essential to solve these problems. Accordingly, the researcher gives some insights to develop and improve the quality of services to satisfy the passengers in train.

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