Determinants of Passengers Perception about Service Quality through 5S- A Study on Indian Railways

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Abstract

Indian Railway is the lifeline of the country being the cheapest and comfortable mode of travelling especially for long distance. This industry being in the service sector, needs to give utmost attention for providing quality service to millions of Indian . Maintaining consistently a high quality of service is a challenge for any organisation. For service producing firms, it is essential to organize every aspect of business keeping in mind to serve the customer best. In this study, an effort has been made to understand the concept of 5S- a methodology-Japanese quality standard- to study the level of the customer satisfaction. This methodology is used to analyse the level of the customer satisfaction for Indian Railways through quantitative analysis.

Key words : *Indian Railways, Service Quality, Customer Satisfaction, 5S Framework*

Introduction

161 years old Indian Railway Services have the largest train networks in Asia. It is world's largest railway system under a single management and one of the most popular mode of travelling in India. Indian Railways have 115,000 kilometres of total track over a route of 65,000 kilometres and 7,500 stations. Most of Indian population largely relies on railways for their journey due to convenience of connectivity and its low cost of commuting. With an extensive networks spread across the country, Indian Railways plays a key role in the social and economic development of India. This is indeed the lifeline of the country. Vanniarajan and Stephen (2008) identified that according to the customer attributes such as reliability, assurance, empathy, tangibles, and responsiveness are   significant service quality of Indian Railways.

Though Indian Rail Services are in the public sector and managed by one monolithic management system under Ministry of Railways, it faces competition from road and air transport facilities and their effective modernization. Service Quality has been recognised as a powerful weapon and the form of differentiation in this era of competition. As service quality is the decisive factor for any service organization to gain competitive advantage,   Railways' Management needs to improve this continuously. In reality the quality of a service may be largely invisible to the customer and perception of service delivery is influenced disproportionately by the manner of treatment at the point of contact. The challenge of this industry is to bring together various facets of

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business to deliver quality service at the point of contact with the customer.

Conceptual Framework

5S Methodology – a technique of quality assessment of service firm- is born out of two techniques viz. Total Productive Maintenance (TPM) and Toyota Production System (TPS). Basically the concept was started in Japan and now widely used in India. 5S is a simple tool for organizing workplace in a clean, efficient and safe manner to enhance the productivity, visual management and to ensure the introduction of standardized working. In addition, it provides a stable foundation to build all improvements through implementing these tools. One of the most important factors of 5S is that it makes problems immediately obvious. 5S is a team run process and needs to be conducted by the people who work within the area in which the principles of 5S are being applied. 5S is a methodical way to organize workplace, working practices as well as being an overall philosophy and way of working. It is split into 5 phases, each named after a different Japanese term beginning with the letter "S"; these are Seiri, Seiton, Seiso, Seiketsu, Shitsuke, hence the name 5S. Some companies add a 6th (6S) of Safety, but it should be an integral part of the steps of 5S and not a separate stage in itself.

Table 1: Five Distinct Phases of 5S

5S	Meaning
Seiri	Sort, Clearing, Classify
Seiton	Straighten, Simplify, Set in order, Configure
Seiso	Sweep, shine, Scrub, Clean and Check
Seiketsu	Standardize, stabilize, Conformity
Shitsuke	Sustain, self discipline, custom and practice

Seiri or Sort is the first step in 5S, it refers to the sorting of the clutter from the other items within the work area that are actually needed. This stage requires the team to remove all items that clearly are not used in the working area and only leave those that are required for the processes in question.

Seiton or Straighten is the process of taking the required items that are remaining after the removal of clutter and arranging them in an efficient manner through the use of ergonomic principles and ensuring that every item "has a place and that everything is in its place."

Seiso or Sweep is thorough cleaning of the area, tools, machines and other equipment to ensure that everything is returned to a "nearly new" status. This will ensure that any non-conformity stands out; such as an oil leak from a machine onto a bright newly painted doors and windows and clean floor.

Seiketsu or standardize is the process of ensuring that whatever we have done within the first three stages of 5S become standardized; i.e., we ensure that we have common standards and ways of working. Standard work is one of the most important principles of Lean manufacturing.

Shitsuke or sustain ensures that the company continually improves using the previous stages of 5S, maintain housekeeping and conduct audits and so forth. 5S should become part of the culture of the business and the responsibility of everyone in the organization.

Table 2: Variables under 5s Framework

5S	Variables
Seiri	Information clarity
	Programs
	Rules
Seiton	Simplify or Easy availability of tickets
	Condition of Railways
	Orderliness of seats
Seiso	Cleanliness
	Checking
Seiketsu	Quality
	Conformity / Attitude of Railway Employees
Shitsuke	Sustain / Cost
	Food & Drinks
	custom / Duty
	Time
	Safety

Review of Literature

Sharma (2006) asserts that railway enquiry counters play a pivotal role in customer satisfaction, this service is far from satisfactory in India. Tandon (2006) observes that improvements in this sector have been undertaken through minimizing ticket dispensing time by modernized passenger reservation systems through the Internet at a large number of stations. He further, highlights that the passengers also want efficiency, effectiveness, and politeness in service. 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. TCRP Report 100 identify elements at bus stations for efficient service which are shelters, waiting rooms and seating, doorways, stairways, escalators, signage and information displays, public address systems, and passenger amenities (including shelters, benches, vending machines, trash receptacles, lighting, phone booths, art, and landscaping). Michalskaetal (2007) finds that 5S implementation results in increase of efficiency, safety and reduction of the industry pollution. His research shows that training of workers about the 5S rules is very essential. It is important to

divide activities on some main steps and to maintain the continuous improvement. It is also important to understand the need of executing the routine inspections of usage of 5S rule. Agrawal (2008) identified the employee behaviour as most important determinant of the customer (passenger) satisfaction with Indian Railway services. Power and Associates (2008) measured overall customer satisfaction of electric utilities through six factors: power quality and reliability, customer service, company image, billing and payment, price, and communications.

Ravinder Kumar Panchaletal (2012) in their paper focused on the methodology adopted in 5S and implementation of the same in the production industry. The 5S rules bring the great changes in the company, for example: the process improvement by costs reduction, increasing of effectiveness and efficiency, maintenance and improvement of the machines efficiency, safety increasing and reduction of the industry pollution and waste. Khedkaretal (2012) studied that 5S implementation influences both instructors and workmen of industry that operates within selected places. The significant improvements are observed with respect to safety, productivity, efficiency, morale and housekeeping. The case study of Shahryar Sorooshian et al (2012) is based on real experience on implementing 5S program presentation on some basic work environment problems. Marko Milosevic et al (2013) explained methods and techniques of lean concept used to increase the efficiency of all processes in the company. The study also presents results of the level of implementation of this method in international and domestic production companies which concludes that large companies pay much attention to "lean" concept to increase both productivity and satisfaction of their employees.

Ramesh et al (2014) has presented an industry application of 5S lean technology at Hari Bio-Mass Processing Unit, and the study suggests that 5S lean technology is utilized to develop an infrastructure for continuous process improvement. A practical 5S methodology is implemented to 10 areas in the plant during the project period of 3 months to clean up the process and improve overall plant operations. Deshpande et al (2015) defines 5s as relatively a simple technique which can be easily applied in any

organization and results are rapidly visible. It ensures that 5S helps to maintain proper workplace management for better use of working area and time saving in searching for tools and materials due to proper location and identification. It increases morale of workers through improvement of working environment.

Objectives and Research Methodology

The study has been undertaken to understand the concept of 5s - Japanese Technique to assess service sector by adopting it to analyse passengers' perceptions of Indian railways on the industry's service quality. In order to carry out the research, the survey method has been adopted. The primary data has been collected using stratified random sampling technique. The different strata of respondents are made according to gender, age and occupation. The structured questionnaire is prepared and circulated among 100 passengers travelling in Indian Railways. The units of analysis were the various variables under Japanese 5S framework influencing the overall service quality of Indian railways.

The following hypothesis has been formulated to examine the satisfaction level of male and female passengers on the quality of services provided by railways.

H_0 – There is no difference in the satisfaction level of respondents on service quality of railways across gender.

H_0 – There is no difference in the satisfaction level of respondents on service quality of railways across age groups.

H_0 – There is no difference in the satisfaction level of respondents from service quality of railways across professions.

Results and Analysis

Objectives of the study were to analyse the various variables under 5S influencing the overall service quality of Indian railways. The demographic characteristics of the respondents are presented in table 3. The gender distribution of the respondent passengers groups was quite uneven, with 62% male

respondents and 38% female respondents. The age group of the respondents was 31-40 years (41%), followed by 21-30 years (38%), and 41-50 (21%). In terms of occupation, 30% respondents are businessmen/industrialist, 62% respondents government servants or professionals (including software engineers, doctors, lawyers, etc.) and 8% of them are students.

Table 3: Demographic Characteristics of the Respondents

Respondents Gender Wise	Total	Percentage
Male	62	62%
Female	38	38%
Age Wise		
21-30	38	38%
31-40	41	41%
41-50	21	21%
Occupation Wise		
Business	30	30%
Service Man	62	62%
Students	08	8%

Table 4 presents the analysis of various 5S variables using Likert 5 point scale. The respondents has given preference to Seiton (Avg. mean 3.68) followed by Seiri (avg. Mean 3.43) and Seiso (avg. Mean 2.94). The least preference is given to Seiketsu (avg. mean 2.86) and Shitsuke (avg. Mean 2.85). Moreover, the differentiation between responses regarding Seiketsu and Shitsuke is negligible. The graphical analysis is also presented is figure1.

TABLE 4: FACTORS INFLUENCING SERVICE QUALITY

5S	Variables	N	Mean	Average
Seiri	Information clarity	100	3.70	3.43
	Policies	100	3.18	
	Rules	100	3.43	
Seiton	Availability of tickets	100	3.66	3.68
	Condition of Railways	100	3.52	
	Orderliness of seats	100	3.88	
Seiso	Cleanliness	100	2.79	2.94
	Checking	100	3.09	
Seiketsu	Quality	100	3.00	2.86
	Attitude of Railway			
	Employees	100	3.54	
Shitsuke	Cost	100	3.62	2.85
	Food & Drinks	100	2.43	
	Time	100	2.80	
	Safety	100	2.55	

FIGURE 1:
Graphical
Presentation
of Factors
Influencing
Service
Quality

Chart 1
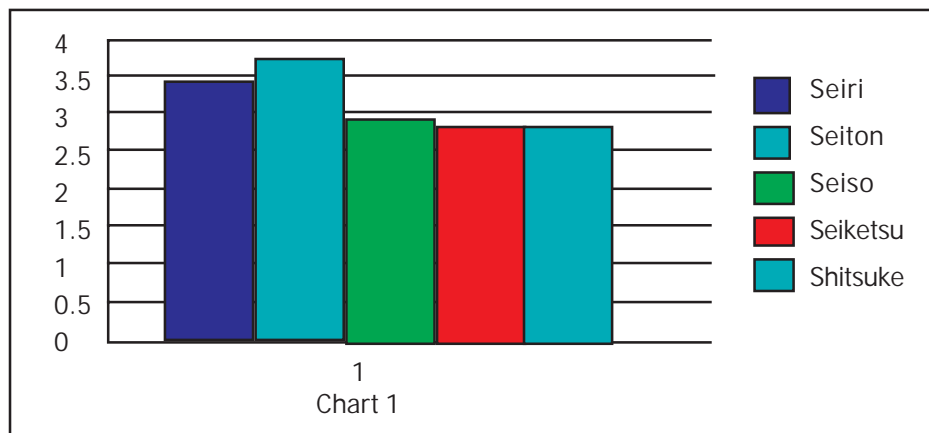
Service Quality Mean Score Responses Across Gender

The following hypothesis has been formulated to examine the satisfaction level of male and female passengers from the quality of services provided by railways.

H_0 – There is no difference in satisfaction level of respondents from service quality of railways across gender

H_1 – There is significant difference in satisfaction level of respondents from service quality of railways across gender

Table 5: Descriptive Gender Statistics

Gender		N	Mean	Std. Deviation	Std. Error Mean
Service Quality Means Score Genderwise	M	14	3.1886	.45963	.12284
	F	14	3.2507	.52446	.14017

Table 6: Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means							
		F	Sig.	t	df	Sig (2- tailed)	Mean Difference	Std. Error Diffe ence	95% Confidence Interval of the Difference		
									Lower	Upper	
Service Quality Mean Score Gender wise	EVA	.784	.384	.333	26	.741	-06214	.18638	.44525	.32096	
	EVNA			.333	25.5	.742	.0621	.18635	.44557	.32128	

EVA – Equal Variance Assumed
EVNA – Equal Variance Not Assumed

The above statistics depicts that Levene's test is non - significant as p value (0.384) > 0.05. It leads to acceptance of Null Hypothesis. So we will consider statistics across EVA. The significant value in t - test is 0.741which is greater than 0.05. There is no difference between means of males and female. The above statistics infers that male and female are equally satisfied by the quality of services provided by railways.

Service Quality Mean Score Responses Across Age Groups :

The following hypothesis has been formulated to examine the satisfaction level of different age groups of passengers from the quality of services provided by railways.

H_0 – There is no difference in the satisfaction level of respondents from service quality of railways across age groups

H_1 – There is significant difference in the satisfaction level of respondents from service quality of railways across age groups

Table 7: Descriptive Statistics Age wise

	Age	N	Mean	Std. Deviation	Std. Error Mean
Service Quality Mean Score Agewise	21-35	14	3.2186	.52071	.13916
	35-50	14	3.2086	.40136	.10727

Table 8: Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig (2- tailed)	Mean Differ ence	Std. Error Diffe rence	95% Confidence Interval of the Difference	
									Lower	Upper
Service Quality Mean Score Agewise	EVA	1.484	.234	.057	26	.955	.01000	.17571	-.35117	.37117
	EVN A			.057	24.42	.955	.01000	.17571	-.35232	.37232

EVA – Equal Variance Assumed   *EVNA – Equal Variance Not Assumed*

The above statistics depict that Null hypothesis has been accepted as p value (0.234) > 0.05 in Levene's test. So, Statistics across EVA has been considered. The higher significant t – value (0.955>0.05) makes an firm statement that there is no difference between means of different age groups of passengers. The above statistics infers that respondents from both age groups (21-35 and 35-50) are equally satisfied from the quality of services provided by railways

Service Quality mean Score Responses Across Professions :

The following hypothesis has been formulated to examine the satisfaction level of different profession of passengers from the quality of services provided by railways.

H_0 – There is no difference in satisfaction level of respondents from service quality of railways across professions.

H_1 – There is significant difference in satisfaction level of respondents from service quality of railways across professions.

Table 9: Descriptive Statistics Age wise

	Profession	N	Mean	Std. Devia- tion	Std. Error Mean
Service Quality Mean Score Professionwise	Self Employ- ment	14	3.19	.408	.109
	Service	14	3.23	.513	.137

Table 10: Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means							
		F	Sig.	t	df	Sig (2- ta iled)	Mean Differ ence	Std. Error Diffe rence	95% Confidence Interval of the Difference	
									Lower	Upper
Service Quality Mean Score Profession wise	EVA	1.129	.298	.232	26	.818	-.041	.175	-.401	.319
	EVN A			-.232	24.759	.818	-.041	-.175	-.402	.320

EVA – Equal Variance Assumed   EVNA – Equal Variance Not Assumed

The above statistics provide strong evidence to acceptance Null hypothesis as p value (0.298) > 0.05 in Levene's test. So, Statistics across EVA has been considered. The higher significant t – value (0.818>0.05) makes a firm statement that there is no difference between means of different profession of passengers. The above statistics infer that respondents from both professions (self-employed and service) enjoy same satisfaction level from the quality of services provided by railways.

Conclusion and Suggestions

The Indian Railway transportation is gaining importance day by day. It is well known that offering better services is vital for the growth of the Indian Railways. The Indian Railways is further required to extend its attention to satisfy needs of customers and take initiatives to improve the quality of service to enrich the satisfaction of customers. It has been found that groups of variables belonging to all 5S i.e. Seiri, Seiton, Seiso, Seiketsu, Shitsuke have been useful to study the consumer satisfaction level. We find that Seiri and Seiton variables are more preferred by the customers and provide more satisfaction to them. It is therefore, recommended that the Ministry of Railways should take all possible steps to propagate the various services provided to the passengers by keeping adequate index boards and bulletin boards in all possible places like rest room, at the entrance, ticket counter, passengers' lounge and platform, work on cleanliness & quality improvement. It may enable the passengers to know about the facilities provided by the Indian Railways. It is also suggested that announcements could be made regarding the services provided by the Indian Railways. It will help to improve the level of awareness of passengers about the services. The study thus provides a direction for railway administration, whereby areas for improving services may be identified and the passenger satisfaction may be enhanced.

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