

A Review of Research on The MSRTC Bus Station Quality Improvement Survey

¹G SHIVA KUMAR, ²A PRAVEEN
³CHINTA SEKHAR, ⁴P THREENADH
Department of Mechanical Engineering,
Pallavi Engineering College,

ABSTRACT

The MSRTC bus station in Amravati, India, conducts a quality function deployment (QFD) survey in order to better understand and identify the needs and requests of its customers and to enhance the quality of the service provided by the bus station. The survey was done using the prescribed questionnaire and delivered to 5000 users in order to discover the demands of the consumers. In the first stage of QFD, the results of these surveys were utilised as feedback. Taking into account every component of the public transportation system, a total of 20 major features and 17 subfeatures were created. The results of the surveys used in this research show that the ticket prices and frequency of the transportation system should be the primary emphasis of this article in order to enhance public transportation quality. Search terms include: MSRTC; Survey; Transportation Service; Infrastructure; QFD

INTRODUCTION

Poor quality service and unmet expectations have made the Maharashtra State Road Transport Organization (MSRTC) a state-owned corporation that offers transportation services to distant or unreachable rural communities in Maharashtra. As a result, many passengers choose to use private transportation, which offers a higher level of comfort. MSRTC's excellent services and facilities are being advertised, despite the fact that they are claiming otherwise. However, ongoing assessments are required to maintain and monitor the infrastructure at each bus stop, as well as the quality of the services they provide. The level of service given at each bus stop should then be monitored using input from passengers in the form of answers. MSRTC bus station in Amravati, India, was examined in this research for its quality of services and amenities by transforming customer feedback into new offerings that actually meet their requirements. In this article, a survey analysis is conducted using information gathered from passengers via questionnaires, interviews, and observations at bus stops pertaining to MSRTC services and amenities, as well as direct

comments from passengers on MSRTC services. As part of this study's research design, the QFD

technique (Quality Function Deployment) procedure is employed in order to identify the emphasis that consumers place on their varied expectations, which are then translated into functional design and linked to operational processes.

LITERATURE REVIEW

This research covers a wide range of topics related to the improvement of service quality. In order to improve the quality of service, researchers use a variety of tools, including those developed by Dr. Arvind Chaudhari, who is currently conducting a study to determine the actual location of passenger comfort facilities at bus stations and the degree to which passengers are satisfied with the services provided by these facilities. It was a pleasure working with Dr. Prakash Vishnu. Public and private transportation services are examined in terms of passenger satisfaction and the causes for passenger discontent in the case of MSRTC on the basis of several psychological and physical characteristics. For the Maharashtra State Road Transport Corporation, Madhuri Rahatgoonkar and Mayura Mathankar both attempted to measure the amount of happiness of passengers and the level of awareness of passengers about its services. To improve road passenger transportation services, Pakdil et al. [22] developed a QFD technique that combines traveller feedback with practical information from the transport service provider. As far as meeting customers' voices goes, staff attention for their customers, technical conditions of buses and error-free facilities were considered to be the most important factors. The sample size of 285 respondents from one focus group was a drawback of this research. In this case study, the QFD technique was used to discover the desires and requirements of urban public transportation users and to improve service quality in Belgrade's urban public passenger transportation. Using QFD to improve public transportation service quality is discussed in this study.

METHODOLOGY

The findings and analysis of this suggested research will be based on primary and secondary data. Using a questionnaire and interviews with passengers who go through Amravati bus station, primary data is gathered from the respondents. Additionally, MSTRC Bus Station employees are surveyed to double-check the information supplied by survey participants and to assist provide helpful suggestions. Methodology's primary goals are

1) to find out what the customers want and need in terms of service quality; and 2) to find out what the customers don't want and need in terms of service quality.

Assessing the relevance of quality features for users;
Assessing the user's satisfaction level;

Comparing the quality of service in public transportation and individual transportation. The following procedures are used to conduct a descriptive survey in this work.

Questionnaire – Research Questionnaire – Population and Sample Selection – Data Analysis Interview

DATA ANALYSIS AND RESULT

The primary goal of this study was to examine the level of customer satisfaction with the MSRTC bus terminal in Amravati, Maharashtra. As a consequence of the data analysis, the following results are presented: Information on the occupants of the vehicle Table.1 illustrates the customer's age, kind of trip, type of bus, and nature of journey.

Group	Travel	Type of travelling	Type of bus	Continuous travel
I	Below 25 years	Less than 10 Hrs.	Non A/C Bus	Continuous
II	Between 26 and 40 years	Less than 15 Hrs.	Non A/C Bus	Continuous
III	Between 41 and 55 years	Less than 15 Hrs.	Non A/C Bus	Continuous
IV	Between 56 and 60 years	Less than 15 Hrs.	Non A/C Bus	Continuous
V	Above 60 years	Less than 10 Hrs.	Non A/C Bus	Continuous

Table.2 displays the total number of survey takers and the breakdown by gender and age. Female participants totaled 2975 while male participants

totaled

2075.

Table 2: Secondary data

Sr. No.	Description	Number of respondent
1	Number of respondent asked to participate in survey	5000
2	Number of groups categorized while surveying	7
3	Number of male respondents	2075
4	Number of female respondents	2925
5	Number of respondents below age 25	850
6	Number of respondents between age 26 and 40	900
7	Number of respondents between age 41 and 55	1575
8	Number of respondents between age 56 and 60	875
9	Number of respondents above 60	800

Table.3 shows the percentage of passenger according to the gender and age.

Table 3: Background information about the passenger

	Frequency	Percentage
Gender		
Male	2075	41.5%
Female	2925	58.5%
Total	5000	100%
Age		
Number of respondents below age 25	850	17%
Number of respondents between age 26 and 40	900	18%
Number of respondents between age 41 and 55	1575	31.5%
Number of respondents between age 56 and 60	875	17.5%
Number of respondents above 60	800	16%
Total	5000	100%

Passenger Reaction A total of 41.5 percent of the participants were male, while the remaining 58.5 percent were female. In terms of respondents' ages, 17% were under 25, 18% were between the ages of 26 and 40, 31.5 percent were between the ages of 41 and 55, 17.5 percent were between the ages of 56 and 60, and 16 percent were beyond the age of 60. This shows that over two-thirds of respondents are between the ages of 55 and 64.

Passengers' answers to service quality measures are shown in Table 4. A quality score of 0.6 satisfies 60% of clients, while 44% are dissatisfied with the cleanliness of the bus terminal and the buses themselves, according to research. A whopping 61 percent of customers are happy with the MSRTC's concessions and bus frequency. While 50 percent of the customers are dissatisfied with the cafeteria service, 78.5% of the clients are pleased with the bus's advanced display system. 55% of customers are satisfied with the employee's conduct; 55% of customers are satisfied with the employee's safety for children; and 60% are satisfied with the employee's safety for women. A whopping 78% of clients are pleased with the ability to send messages at

predetermined intervals. Passengers' answers to service quality measures are shown in Table.4.

Table 4: Responses of passengers on service quality indicators

Respondents										
Sr. No	Items	Satisfied		Unsatisfied		Quality Index				
		Freq.	%	Freq.	%					
1.	Current charges of booking	3000	60	-	-	2000	40	-	-	0.6
2.	Time table of bus	2550	51	-	-	2450	49	-	-	0.51
3.	Availability for reserved seats	2525	50.5	-	-	2475	49.5	-	-	0.50
4.	Cleanliness of bus stop	2275	45.5	525	10.5	2200	44	-	-	0.54
5.	Concession in pass for daily travelling	3050	61	-	-	1950	39	-	-	0.61
6.	Punct timing	3050	61	-	-	1950	39	-	-	0.61
7.	Opinion about facility during travelling	2500	46	-	-	2700	54	-	-	0.46
8.	Treatment for physically handicap person.	2975	59.5	-	-	2025	40.5	-	-	0.56
9.	Interior of bus	2750	55	350	7	1900	38	-	-	0.62
10.	More number of buses on route	3750	75	-	-	1250	25	-	-	0.75
11.	Canteen facility	2175	43.5	300	6	2825	56.5	-	-	0.5
12.	Advance technology display of routes in bus	3925	78.5	-	-	1075	21.5	-	-	0.78
13.	Behavior of bus employee with passenger	2950	59	325	6.5	1725	34.5	-	-	0.65
14.	Quality seats, ventilation & luggage placement facility	2775	55.5	175	3.5	2050	41	-	-	0.6
15.	Women's safety	3000	60	-	-	2000	40	-	-	0.6
16.	Children's safety	2775	55.5	-	-	2225	44.5	-	-	0.55
17.	Reservation facility in bus like railway facility	3125	62.5	-	-	1875	37.5	-	-	0.63
18.	Pollution level due to buses	1525	30.5	1750	35	1725	34.5	-	-	0.66
19.	Facility of messages of timing to bus to daily passengers	3900	78	-	-	1100	22	-	-	0.78
20.	English speaking or get proper facility of reserved seats	3200	64	-	-	1800	36	-	-	0.64

Passenger satisfaction Customer satisfaction is seen in Table.5. The majority of customers are satisfied with the MSRTC's service, as shown by their comments. Around 80% of MSRTC's clients are satisfied with the service they get. According to 68 percent of respondents, MSRTC travel is always a better alternative than other modes of transportation. The MSRTC was rated as a good choice by 64% of clients, while 32% of customers were dissatisfied with the company's services. In addition, 76 percent of MSRTC passengers said they would recommend

the service to others.

Sr. No.	Items	Agree		Strongly agree		Disagree		Strongly disagree		No comment		Satisfaction index
		Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%	
1	Are you satisfied with MSRTC Amravati?	2200	44	1800	36	800	16	200	4	-	-	3.6
2	Travel with MSRTC is always better travelling option?	1600	32	1800	36	800	16	600	12	200	4	3.8
3	Do you think that travel with MSRTC is good for all age group?	800	16	2400	48	1200	24	600	12	-	-	4.8
4	Recommendation of travel with MSRTC to people is the good suggestion?	1800	36	2000	40	400	8	400	8	400	8	4.3

Application of QFD method process at MSRTC Bus station

MSRTC bus station in Amravati, India, underwent a nine-step procedure to determine service quality, based on customer requests, which resulted in a definitive solution to transportation service issues. A user's request must be identified in the first step. More ladies (58.5 percent) than men (47.6 percent) utilised MSRTC transportation (41.5 percent). It's noteworthy that 66% of clients are under the age of 55. The QFD process is based on the user's demands, which are the foundation of the quality matrix. The most important step in defining and expressing high-quality service is to know precisely what clients want [39]. Twenty elements and a total of 17 sub-features were utilised to characterise all aspects of the quality of system and services in urban public transportation in this study (Table 1).

Defining Importance of Users' Requests.

Customers were asked to rate the value of several quality sub-features, and the results were interesting. Every feature was given a score based on how important it was to real-world consumers. Customer needs and importance ratings are shown in Table 6.

Comparison with Competition. The goal of this phase is to provide a greater level of service compared to the competitors. Travel and taxi services were chosen for comparative investigation. Benchmarking was used to illustrate how the service

stacks up against the competition from the perspective of the end user. A five-grade scale (from 1 to 5) is used for comparison. Compared to the MSRTC system, taxi services were scored worse in terms of ticket price, frequency, age relaxation, and personnel training. As expected, vehicle comfort on MSRTC's public transportation was rated very low, which comes as no surprise given the issues surrounding public transportation in general. The fleet's age is also a contributing factor. When compared to MSRTC's travel services, the safety of women and children, as well as emergency contact information, were all rated worse. All prior studies of assessed quality of service indicated that vehicle comfort is the quality service characteristic where customers in urban public passenger transportation are the least happy. This data is important since it is in accordance with these findings. [40]

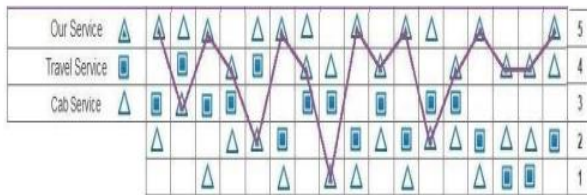
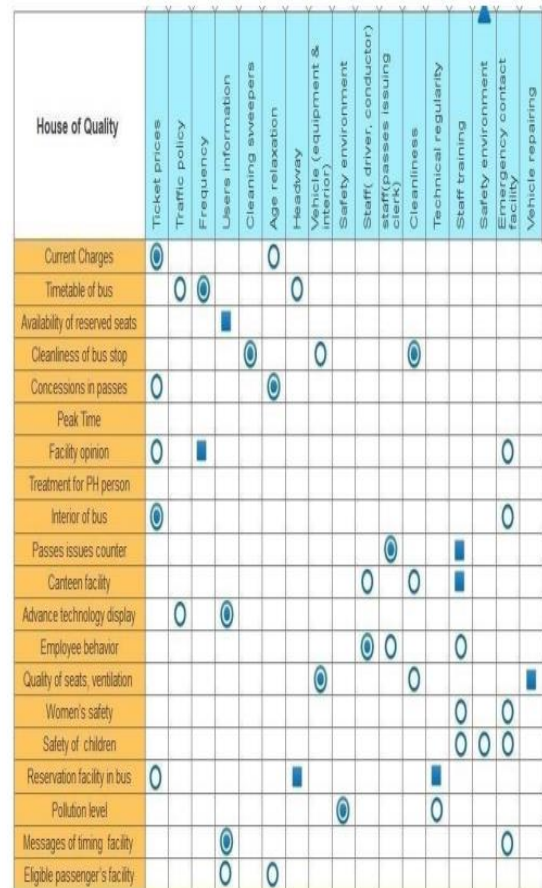


Figure.1: Comparison with competitors

Service Features Definition.

The next stage in the approach is to describe the aspects of the service that have an impact on the fulfilment of each request that has been made. Key performance indicators (KPIs), i.e. aspects that qualitatively define customers' desires, were picked from a broad variety of transport offer items and other components of the delivered transport service [41]. Tariff policy and pricing policy were exposed by three factors (ticket price, tariff policy, concession in passes). Headway and frequency are dynamic elements of a transportation network, whereas vehicle attributes are a fundamental resource (technical regularity, interior of bus, vehicle repairing). The following characteristics were chosen for inclusion: (pass issue counter, pollution level, user information level, safety environment, cleanliness, canteen facility). Staff training is one of the final system elements. A user-driven functional specification is the foundation upon which all features are built. Improvements in these features result in better service, improved operational demands being completed, and therefore the user receives what he or she is looking for in the end (expected quality of service). Resolving any discrepancies between what

customers want and how we provide it in Step 5. The core matrix of the House of Quality was used to establish a link between the service design and the needs of the consumers. The strength of the relationship was shown using several symbols, atomicity 1–3–9 (grade 1 stands for weak connection, grade 3 middle and grade 9 strong connections). Models of interdependence among the aforementioned variables have been established in the literature and used to define the degree of correlation. Just how one user request may be affected by a number of service features, a single user request can be affected by many service features, as indicated in the figure. For example, there was a strong correlation between the current fees and ticket prices, as well as between factors such as how frequently buses run on a schedule and how clean the stops and sweepers at those stops are. There was also a strong correlation between age restrictions at the pass issue counter and the behaviour of the staff who issued passes. User demands and service features are intertwined in Table 2 as a whole.



Connections between Service Features. " The top of the home has a matrix that points out possible conflicting goals between two elements.. Symbols

were used to demonstrate interdependence, and the link between them might be strong or weak, positive or negative, or have no relation at all. Additionally, previous studies on the interdependence of transport service aspects were included into this study. This study found high correlations between ticket price and age relaxation, frequency and headway, cleanliness and cleaning sweeper, automobile interior and vehicle repair, as seen in figure 3..

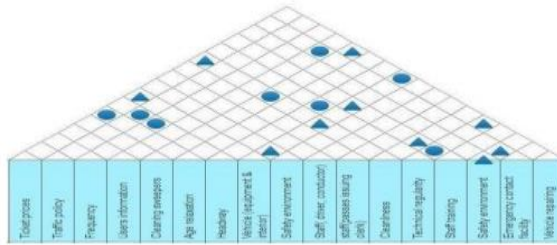


Figure 3: Correlations between Service Features.

Quality Plan.

As a part of strategic management of public transportation, this stage establishes a quality plan, which includes criteria for the significance of users. On a scale from 1 to 5, 1 represents a change, 3 represents development, and 5 represents a service that is better than the competition's; a sale factor, which assigns 1 when a service has a negative impact on sales and 2 when a service benefits sales, is also included in the strategy. Table.6 displays the importance of customers.

Sr. No.	Customer requirement	Customer Importance rating
1	Current Charges	5
2	Timetable of bus	5
3	Availability of reserved seats	3
4	Cleanliness of bus stop	4
5	Concessions in passes	2
6	Peak Time	4
7	Facility opinion	2
8	Treatment for PH person	2
9	Interior of bus	2
10	Passes issues counter	2
11	Canteen facility	2
12	Advance technology display of routes	3
13	Employee behavior with passenger	3
14	Quality of seats, ventilation and luggage's facility	4
15	Women's safety	4
16	Safety of children	4
17	Reservation facility in bus like railway facility	3
18	Pollution level	3
19	Messages of timing facility	3
20	Eligible passenger's facility for reserved seats	2

Service features analysis.

Following an examination of the acquired data and an arithmetic summation of all products representing the value to users and the degree of connection between each service characteristic, the following formula was used to calculate the pre-final step's absolute importance: Absolute = significance of the customer X importance of the connection Individual absolute values are multiplied together to get the sum total. According to the findings, system operational characteristics have the largest impact (reliability) on MSRTCE service in Amravati: ticket price has a 13 percent relative value; user information has a 9.7 percent relative importance; frequency has a 9.1 percent relative importance. As demonstrated in figure 4, cleanliness accounts for 8.3 percent, the inside of the car for 7.0 percent, and age relaxation for 6.0 percent..

Absolute	84	36	59	63	36	39	18	48	27	33	36	54	12	37	12	45	8
Relative	13	5.6	9.1	9.7	5.6	6	3	7.4	4.2	5.1	5.6	8.3	1.9	5.7	1.9	6.9	1.2

Service Features Importance Ranking.

Every service feature received a score based on its absolute and relative value. Some service characteristics were graded in significance by giving values of 1 to 10 for the most significant solutions and 10 to the least important solutions in this stage. It's important to order features according to significance, but it's also important to rank features according to their absolute and relative importance, therefore the ticket price should come in first, followed by user information in second place, and frequency in third place. Cleanliness, emergency contact, and staff training are placed fourth, fifth, and sixth, respectively. It is possible to improve service quality and consumer happiness by focusing on these important qualities. The second stage of the QFD approach is represented by these characteristics.

As a part of strategic management of public transportation, this stage establishes a quality plan, which includes criteria for the significance of users. On a scale from 1 to 5, 1 represents a change, 3 represents development, and 5 represents a service that is better than the competition's; a sale factor, which assigns 1 when a service has a negative impact on sales and 2 when a service benefits sales, is also included in the strategy. Table.6 displays the

Journal of Management & Entrepreneurship
ISSN 2229-5348
importance of customers.

Sr. No.	Customer requirement	Customer Importance rating
1	Current Charges	5
2	Timetable of bus	5
3	Availability of reserved seats	3
4	Cleanliness of bus stop	4
5	Concessions in passes	2
6	Peak Time	4
7	Facility option	2
8	Treatment for PH person	2
9	Interior of bus	2
10	Passes issues counter	2
11	Canteen facility	2
12	Advance technology display of routes	3
13	Employee behavior with passenger	3
14	Quality of seats, ventilation and luggage's facility	4
15	Women's safety	4
16	Safety of children	4
17	Reservation facility in bus like railway facility	3
18	Pollution level	3
19	Messages of timing facility	3
20	Eligible passenger's facility for reserved seats	2

House of Quality	Ticket prices	Traffic policy Frequency	Users information	Cleaning sweepers	Age relaxation	Headway	Vehicle (equipment & interior)	Safety environment	Staff driver, conductor staff passes issuing	Cleanliness	Technical regularity	Staff training	Safety environment facility	Emergency contact facility	Vehicle repairing		
Absolute	84	36	59	63	38	39	18	48	27	33	36	54	12	37	12	45	8
Relative	13	5.6	9.1	9.7	5.6	6	3	7.4	4.2	5.1	5.6	8.3	1.9	5.7	1.9	6.9	1.2
Importance Ranking	1	6	3	2	6	6	8	5	7	7	6	4	8	6	8	5	9

Figure 5: Importance ranking

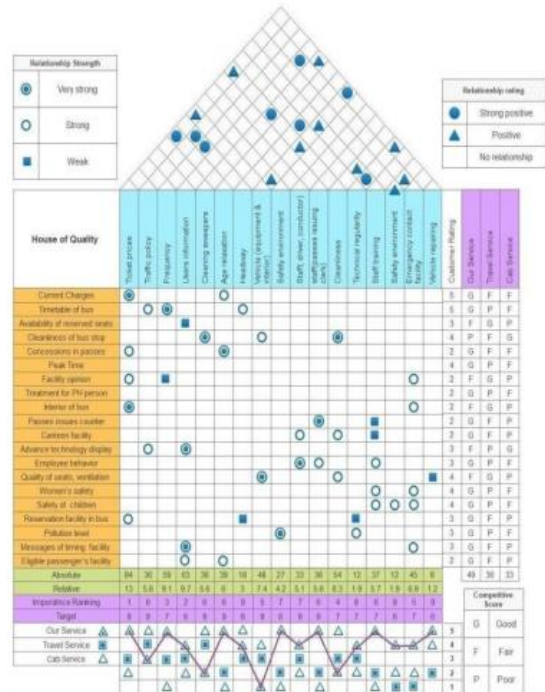


Figure 6: House of Quality developed in relation with quality of service at MSRTC Bus station in Amravati

CONCLUSION

The results of the survey analysis suggest that the MSRTC transportation system makes use of the QFD approach. Qualitative and quantitative data analysis (QFD) was found to be an appropriate and suitable method for assessing the importance of quality of service features for public passenger transport system users in Amravati district, India, according to the study published in the International Journal of Scientific Research in Science and Technology (ijsrst.com) | Volume 8 | Issue 5 Prof. Sunil R. Kewate et al. After conducting a survey and implementing QFD to MSRTC services, the following may be concluded: According to the findings of the survey, drivers and conductors have extensive training in passenger service. There is no canteen at almost all of the bus terminals. The survey found that MSRTC passengers in the Amravati district are still dissatisfied with their service. Overall, the quality of bus station services, the current knowledge and competence of drivers and conductors, and the ethics of service providers need to be enhanced. In each category, almost all respondents were concerned about the quality of public transportation. As a result, clients complain about poor service in the transportation industry. Interestingly, 76% of MSRTC customers said they

would suggest the service to their friends and family over other possibilities. The most significant impact is created by system operating characteristics (reliability), according to an examination of service features conducted at the house of quality: 13 percent of the weight is given to ticket price; 9.7 percent is given to user information; and 9.1 percent is given to frequency. The value of cleanliness is 8.3 percent, the inside of the car is 7.4 percent, and age relaxation is 6 percent; the importance of staff behaviour is 5.1 percent; the importance of progress is 3 percent; and the importance of vehicle maintenance is 3 percent. Finally, based on absolute importance, the order of aspects that should be upgraded to have maximum benefits and maximise user happiness is as follows: 1.2 percent Ticket price is number one, followed by user information, frequency, cleanliness, and age of the vehicle's interior.

REFERENCE

- [1].Dr. Arvind Chaudhari "A Study of facilities provided by Maharashtra State Road Transportation Corporation at Bus station to passengers in Maharashtra" vol.3 issue 4. April 2015-43
- [2]. Dr. Prakash Vishnu Pise "Study of Quality Services provided by MSRTC with special reference to Pune division" Bulletin Monumental,vol 21 issue 7 2020, <http://bulletinmonumental.com/>.
- [3]. Madhuri Rahatgaonkar, Mayura Mathankar "A study of passenger satisfaction in Maharashtra State Road Transportation Corporation in Amravati District" IJETR, Vol 6 Issue 4 Dec 2014.
- [4]. Miss. Naziya Maldar "Maharashtra State Road Transportation Corporation (MSRTC, India): A study of issues and challenges" UGC Care Journal, Vol: 44, NO. 01(XX), Jan.-March (2021)
- [5]. Dr.Urmila Vikas Patil " Analytical Study on Problems of Maharashtra State Road Transportation Corporation" JETIR, Volume 5 Issue 5 ,May 2018.
- [6]. Kurtulmuşoğlu FB, Pakdil F, Atalay KD. Quality improvement strategies of highway bus service based on a fuzzy quality function deployment approach. *Transp A Transp Sci* 2016;12:175–202
- [7]. Filipović S, Tica S, Živanović P, Milovanović B. Comparative analysis of the basic features of the expected and perceived quality of mass passenger public transport service in Belgrade. *Transport* 2009; 24:265–73.
- [8]. Rao KCA, Thakar G, It M. Enhancement of Customer Satisfaction by QFD in Bus Service 2013:202–5