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DIMENSIONS OF SERVICE QUALITY-AN EMPIRICAL STUDY ON COMMUTERS USING DELHI METRO

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Abstract---*The purpose of this paper is to find out the different factors related to quality of service in Delhi metro firm and to pinpoint the most domineering element in service quality by Delhi metro. In the present study we have used Descriptive research design, in order to get more insight about the research issue in the concern context. In our study there are 240 respondents who regular travelers of Delhi metro. In sample units, we concern to commuters to get the response about various dimensions of service quality of Delhi metro. There are five dimension of service quality of Delhi metro. They are reliability, tangibility, empathy, assurance, responsiveness. Tangibility factor is the max paramount point in utility choiceness. All the dimension of service quality contributes in the overall service quality of Delhi metro. Reliability has a better impact over service quality on Delhi metro among other service quality dimension. Notable number of research and surveys has been conducted on service quality of different transport means and various dimensions have been explained.*

Keywords--- *Quality of service, Delhi metro, commuters*

I Introduction

Newly, quality of service is curves with talking with one in question that are regularly conversed in bounds of well being top brass. Academics and expounders concur just quality of service is one of the success facets enclose in servicing. In addition, quality of service becomes important, as several studies have shown that the emphasis on increasing customer satisfaction, customer loyalty, positive advisories and redemption intentions is the unhackneyed patron enticement. Corporate depiction, profitability together with yields. Quality service analyzers acceded in order that make-up appertaining to service ability shall be assessed from the frequenter's slant. Convey grips momentous mantle in the up of lucrative build out concern to notion on concocting jobs plus maintain sustainable viable deeds. Cart courses societal along with financial interactions enmeshing concrete movableness based on populace also stuffs. Probe into class peculiar to service is high priority overriding element is heed of behoof companies such as subways trying by way of make it also go on in the current vying environment. From service surplus quality id est SERVQUAL mock-up highlights the problems of transcendence appropriateness to entirely obtainers over each state. The service cum quality mode exist examining means of access to determine an asymmetry amidst customer suppositions in affixing to their perception referring to gradation. Quality of service (QS) is a comparison of expectations (E) with performance (P) SQ = P-E.A high-quality service business will meet musts about customers whilst staying reasonably cut throat. Tweaking level

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containing of benefit can escalate pocket ambitiousness Stated goal mayhap workout through comprehension furthermore bettering business proceedings and identifies shortcomings fast and specifically set justifiable as well proven benchmarks for well being consummation moreover measure customer complacency along with else attainment closure. To determine the quality of serviceof the Delhi metro it is important to understand various aspects of service quality of Delhi Metro (India).

There are different parameters over which service quality is judged, it cover weather the staff is knowledgeable or not, adequate number of metros are available in the metro or not. The physical evidence of the metro is serving the metro properly etc. Dimensionality concerning utility category is extensive. The dimensions of service quality is important because it refers to aspects of service quality which should givendue consideration in finding the level of service quality.

It also helps in knowing the extent of which passengers are satisfied which the service quality of Delhi metro. Five dimensions of quality of service are given by Parsuramanie tangibility, responsiveness, reliability, assurance and empathy. Here in the topic dimensions of service quality will be determined. The dimensions will be determined by asking the expectation level of the passengers. Compass view as betterment level is for reaching because to sustain then competitive world so that they can improve their service quality. The Delhi monorail is an elevated railway construction portioning transportation facilities in Delhi as well its station conurbations, or which can be connected to the nearby burghs of Gurgaon, Faridabad, and Ghaziabad by the same Noida in nationwide central of India. The Delhi subway is the 12th better tube set-up within the world in terms of the length of the areas covered by the metro and the number of stations served. The network is a member of the Nova metro group, and contains five regular color codes and the fastest Airport Express, also known as the edge, withal full scale radius as of 213 kilometers plating 160 terminals(counting 6, new stations ahead ofthe airport express line).The alignment contains a variety of stations with below ground, ground level in conjunction with high rise depot applying standard gauges. The Delhi Metro Rail Corporation Limited (DMRC), a public bureau by matched joining of the ministry of India along the regime of Delhi has built further and operated the Delhi Metro. The Delhi Metro Rail Corporation (DMRC) has been accredited by the United Nations as the world before all else monorail and rail structure to “obtain carbon credits to reduce greenhouse gas emissions” moreover reduce it by 630,000 tons every year. The DMRC does approximately 2,000 daily journeys between 05:30 and 00:00 with movements ranging between 1 and 2 minutes and between 4 and 10 minutes. Rails are chiefly four, six and eight coaches. The energy provided is equipped through an alternating current of 25 kilovolt and 50 hertz via a centenary above your head.

II RESEARCHMETHODOLOGY

The information needed to complete the study is based on a questionnaire. The questions are designed to know the quality of service provided by Delhi Metro according to the SERVQUAL model. The analysis would be based on primary data collected through a questionnaire and information obtained via the internet and newspapers regarding DELHI METRO in India.

The design of the research is descriptive because we have to find the quality of service of DELHI METRO by knowing the experience of passengers who have used METRO services.

METHOD OF DATA COLLECTIONS

1. PRIMARY DATA:-

Primary data is the first-hand data used specifically for the research concerned. Primary project data is collected using a questionnaire completed by the respondents.

2. SECONDARYDATA

Secondary data used in the project was collected from various articles, websites and books.

Sample Size and Sample Unit

The sample size is the numeral regard to respondents who are properly called for wrap up the questionnaire so that the study can be generalized. 280 respondents who are all Delhi Metro passengers and the respondents we contacted were the current passengers on the Delhi Metro. Questionnaires were completed at the various metro stations, namely Laxmi Nagar (blue line). Nehru Palace (purple line), ChandniChowk (red line), Saket (yellow line), (green line), (orange line) took 230 questionnaires because 23 questionnaires were incomplete and 27 questionnaires were inappropriate. 230 responses were provided to the approximate figures on the quality of service of the Delhi metro inINDIA

Example of selection procedure

The sample selection is the procedure by which we select the sample for research purposes. We used a multistage sample selection technique. In the beginning, we used the random sampling technique to select the metro stations of six different metro lines in the city of Delhi as it was not possible to select all the metro stations in the city due to lack oftime.

In the second step, we used the convenience sampling technique to collect the respondents' responses because they were not readily available and it was not possible to classify them based on their visits to the survey metro stations. It took three weeks to gather responses from therespondents.

DATA COLLECTION METHOD AND INSTRUMENT

1. In this research, total 240 respondents are participated fairly with the age group of 18-46. Participants are varying from student to professionals or business man or self-employed person highlight the diversity of the survey. The sampling technique uses for the research paper is simple convince sampling by age. Customer with different demographic character has different opinion, shows diverse nature of servicequality.

2. The data has been collected through primary data together with secondarydata.

DATA INTERPRETATION AND ANALYSIS TOOLS AND TECHNIQUES

We use SPSS, a latest generation tool to easily analyze data. Then we entered data into Statistical software and developed graphs and graphs from the data. Factor analysis and multiple regressions were used as an SPSS tool.

III NEED OF THE STUDY

For improving the service standard of any service providers, understand the width belonging to high quality assistance which is needed to satisfied in order to improve the service quality of service, to determine the dimensions of service quality there is need to sense the parameter of buyer eagerness through the service providers and also to know have their dimension can be achieved. The project is undertaken to recognize

dimensions of the quality of service for the Delhi metro (India).The market survey has been done on Delhi metro station. This project is useful for the better understanding of the dimensions of service quality of Delhi metro. In this research paper we studied the pre and post satisfaction level of passengers those who avail the service of Delhi metro. There is also an overview of factors of service quality regarding which factors are more important for the upliftment of service quality of Delhi metro. This study will help Delhi metro to know the most important way by which they can uplift their level of service and know the customer perception regarding what are the dimensions of service which satisfy the passengers need for using public transport. It is also found that Delhi metro is having good market image in the market of public transport the present era is the era of consumer which is here in the study is the passenger, who avail the service of Delhi metro. Passengers are more knowledgeable and understand their need and wants of public transport. So now the service provider of Delhi metro should be avail of the expectations of the passengers through the Delhi metro. So this study of service quality of Delhi metro is tried to enhance magnitude of quality of service through knowing expectation along with perception of quality of service in Delhi metro. From the study, we found that this study will help Delhi metro to know the well nigh imperative depths regarding to benefit in line. By which they can improve the backing and know the various passengers perception regarding Delhi metro of servicequality

IV LITERATUREREVIEW

The SERVQUAL service replica came to pass in 1988 through the clump of American writers, “Parsu”, Parasuraman, Valarie Zeithaml and Len Berry. It high spots the highlights the key intrinsic of serviceability. Initially, SERVQUAL composers pinpointed ten bits on servicing standards, authenticity and receptivity, savvy, means of entry, deference, transmission, plausibility, surveillance, customer comprehension and tangible elements, but these were grouped into five factors: reliability, assurance, tangible elements. , empathy and responsiveness

SERVICE QUALITY MODEL

In course of amenity delicacy literary texts, duplet standpoints control over the headway in concern the servicing rank ganging representation namely the Nordic frame of reference as more the American stance (Brady and Cronin 2001; Jen et al. 2011). Standard of the avail quantifying copy root at the Nordic outlook has been hyped through the name of groonross(1984). He suggested in order that the fineness about the service should include three dimensions, namely functional quality, technical quality and brand image. The technical quality dimension refers to the technical problems of services and focuses on answering the question clientele land later employing the avails (Gronroos, 1984). One more countenance, utilitarian class highlights rejoinder to the quizzing of after what precedent assistance is rendered towards patron (Gronroos, 1984).Thusly, it could be conceded such; serviceable rank is focused ahead of service delivery stratagem (Gronroos, 1984). By and by, the image extent connect with the business is “the result of the perception that consumers have of the business. As a result, the brand image can be expected to be built primarily by the technical quality and functional quality of its services” (Gronroos,1984).

Explication concern of servicing rank extensity hinge on Nordic panorama

Dimensionality	Annotation
Functional Quality	"The dimension consists of the seven attributes that are process related –Behavior, attitude, accessibility, appearance, customer contact, internal relationship,Service mindedness"
Technical Quality systems,andmachine	"The dimension consists of five output-related attributes – employees' technical ability, employees' knowledge, technical solutions, computerized quality"
Corporate thesupplier" Image	"The dimension described customer's general perception of

Source: Gronroos (1993, in Akhtar, 2011)

SERVICE ASPECTS MEASUREMENT

The American perspective believes that the quality of service includes five dimensions: tangibility, reliability, reactivity, reassurance and pity (Parasuraman et al., 1988). These five arrays are the updated rendition with reference to serviceability reported by Parasuraman et al. Found. (1985). Parasuraman et al. (1985) bring into being that superiority of benefits has ten aligns ; openness, precision, tangible benefits,accession,transmission,proficiency,integrity,civility,protection and customer knowledge. The quality of service from the American eyesight is termed as SERVQUAL. The form has been checked for the first time on banking, credit card services, as well as electrical and repair services, telephone distance aids along with brokerage utilities. Some research workers have embraced SERVQUAL in added service quarters aforesaid as hospitality. (Gabbie and O'Neill 1996, Markovic and Raspor 2010, Blesic et al.SERVQUAL is also widely used by academics and practitioners to measure the quality of public transport services (Erdil and Yildiz, 2011; Chikwendu et al., 2012).In the service management belles- letters in addition to two angles close to high quality of service appraisal, markedly the non-confirmation prospects as well as work view (Suuroja, 2003).

Explanation of service quality's dimensions based on American perspective: - SERVQUAL Dimension

Dimension Explanations

Tangibles	It includes the physical appearance of the facility of the service, thepersonnel, equipment'setc.
Reliability	It's about the service provider's ability to deliver the promise service accuratelyand reliably.
Responsiveness	It is the compliance about the service mainstay/operator to be benficient as wellas quick in yielding theavail.
Affirmation	It attributes to the expertise and civility concerning employees plus theirprowess emboldens poise.
Compassion	It cites to tendering, individual regard to thecustomer

MODEL ABOUT FINENESS REFERRING TO QUALITY OF SERVICE IN POPULACE TRANSIT

It necessary to develop a high quality serviceability replica that is consistent alongside the peculiarities characterization attribute to all in all aid more the artistic text based on the serves.In the frame of reference ,people conveyance benefits, part of analysts have attempted to present for action a model of supremacy services that is thought out according to traits pertain to servicing.Wen et al.(2005), For instance runned a pursue ahead of the context of toll call bus services in Taiwan. They have evolved a quality model for communal carry that includes four dimensions; quality equipment on board, staffattitude,on-site conduct along with work conduct. In distinct countryland,spain,perez et al.(2007) mutated SERVQUAL furthermore constituted anew model of fine service in part of local bus service. The form was then labeled QUALBUS.

QUALBUS has five ambits, that is to saytacticality,authencity,responsiveness,assertion plus affinity.In the text refer to fast transport.Lai and Chen(2011) projected two dimensionalities about servicing superiority ,namely the basic service moreover the real environ,although certain corses have refined a service superness copy conducive to servicing.

In the case of land transport, preceding learning even had frailty, like as; initial few analysis did merely factor study analyses to maturate an avail model; choiceness of service Prasad and Shekhar 2010; Randheer et al 2011; Archana and Subha 2012); second, the another audits did not proofed the validity connected to model on the discrimination (e.g., Marketal., 2005), and third, part of inspections not inany way some confirm the validity of the model's criteria (e.g., Lai and Chen, 2011, Wenetal Finally, not all previous studies performed a constancy scrutiny, that is, the tester re-examined the results on the basis of the trait contrasts differences of the respondents, important because the results of the close study along with confirmatory factor analysis (CFA).) may be exist futile in case aspect divergence of the respondents influence the assessment of the quality of the respondent's service element (Hair et al., 2010).

DIMENSIONS OF SERVICE QUALITY

Different researcher has given unalike proportions reference to servicing standards transportation. The dimension of coming from differ country wise and even different researchers has given different dimension rank of service quality of transportation as per their findings. Some are listed below

TRANSMISSION QUALITY OF SERVICE MODELS

Dimensions of quality of service in public transport

DrBekranjct Singh Hundal (2015) assesses the quality of service of the Northern Railway using the SERVQUAL model: dimensions, response, assurance, tactility, empathy, and reliability

Office of Rail &Road (2015) Passenger rail service satisfaction quality & Methodology report where dimensions were Methodology, historical background, relevance of the data, accuracy & reliability, Time lineless & punctuality, Accessibility

Sheeba. AA (2013) South Indian Railway Quality of Service - Determinants of Train Passenger

AUTHORS	MEANS OF TRANSPORTATION	COUNTRY	DIMENSIONS
Lai and Chen (2011)	Mass rapid	Taiwan	Core service and psychical model Transit
Randheer et al. (2011)	Commuter	India	Reliability, responsiveness, assurance, empathy, and culture
Prasad and Shekhar (2010)	Railways	India	Affirmation, affinity, factualness, receptiveness, tangible, complacency, tie-in ,besides ease, Performance, operational performance
Caro and Garcia(2008)	Travel Agency	Spain	Privy interplay, concrete habitat as also aftermath
Perez et al. (2007)	Bus Service	Spain	Tactility, constancy, receptiveness, troth as more as compassion
Hu and Jen (2006)	Bus Service	Taiwan	Intercommunication apace with commuters, touchable aid
Wen et al. (2005)	Bus service	Taiwan	Onboard amenity, crew's attitude, station

Satisfaction and Quality of Service: Basic Amenities, Health, Safety and Security, Catering, Health Services, Punctuality, Conduct towards Passenger Passengers.

Okeudo Geraldine (2013) Effect of airlines Service Quality on airlines image& Passengers Loyalty Attribute, Service Quality airlines, Behavioral, intention (reliability, Customer service, Convenience & Accessibility) in-flight service & clarity, coherence & Comparability.

Sajed Muhammad Irfan (2012)Service quality of rail transport in Pakistan and dimensions are (Tangible, Empathy, Assurance, Safety, information, food, responsiveness)

Devi Prasad Maruvada (2012) on the effect of individual dimensions of railway services. Quality: Indian Railwaypassenger services results. RAILQUAL under development included the following: booking and ticket reservations, railroad platforms, train service, employee service, punctuality, safety, security.

Noel Y.M Siu, Jeff Tak- hing Cheung (2001) Weigh about selling serv relieve quality dimensions were Personal interaction, Policy, Physical appearance, promise, problem solving andconvenience.

Sheng-HshiungTsaur (2001)The innovation of airline Service Quality by Fuzzy And MCDM and dimensions were Responsiveness, assurance, empathy, tangibility, ratability.

R.Archana (2012) A study on service quality& passenger satisfaction on Indian airlines and focused on dimensions like In flight service, In flight Digital Service, Airlines back office Operation.

Geetics, ShefaliNandan (2010) Determinants of customer satisfaction with service quality: A study of the rail platform in India and its dimensions: refresh behavior in the efficiency of information systems in India passengers

SUMMARY OF THE LITERATURE STUDY ON PATRON CONTENTMENT WITH REGARD TON SUPERBNESS IN REFER TO IN DIFFERENT SECTORS

RAILWAYS

1. reliability, insurance, empathy, tangible benefits and openness (Vanniarajan and Stephen(2008))
2. Notion of employees moreover else aspects Agrawal (2008)
3. Accessibility concerning transport services, overseeing of services, commute hour,preservation, maintenance & furthermore expansion (TCRP reports 88 and100).

BUS TRANSIT

Obtain ability in regard to shelters as well as settles placed at bus stoppages, nattiness, overabundance, data set-up, conservation, staff care, staff availability, real status in pertain to bus stations. Eboli and Mazzulla (2007), (TCRP 100 Reports)

FULL-SERVICE RELOCATION BUSINESSES

Conveyance attributes goods, storing serviceability, drop-off avail, non compulsory inclusion, estimation, stuffing serve, assurance/causality calls (key conveniences, diverse support means)

JD Power and Associates Reports (2007)

GAS AND ELECTRICITY PURVEYORS

Classes along with soundness, users value, corporate figure, invoicing as well clearance, pricing, communication, information systems J.D. Power and employee reports (2008a, 2008c)

INTERNET SERVICE PROVIDER (ISP)

Pursuance as with dependability, value belong to servicing, patron perk,recording,offers add with furtherance J.D. Power and Associates (2008b)

QUALITY OF SERVICE IN BANKING SECTOR

Value of banking Geetika et al. (2008)

Primitive amenities, comfort, employee demeanor, generic aura. Jham and Khan (2008)

QUALITY COMMITMENTS AT CONSULTANCY SERVICES

Employee consulting etiquette, benefit perfection behavior Sonne (1999)

QUALITY SERVICES OF HEALTHCARE SECTOR

Healthcare information system in proviso appropriate to well timed,certainity plus fullness , speed, accuracy and completeness information system Ribiere et al. (1999)

Transmittal by sufferers (intellgence system), competency regarding force, behavior of force,superiority about smoothness and recognized figures Andaleeb (1998)

V 5. OBJECTIVES OF THE RESEARCH PAPER

1. To explore the length as concern measuring excellence of servicing in consequences ofDelhi metro.
2. To measure an impression made from explored dimensions of availeminence.

VI ANALYSIS AND INTERPRETATION RELIABILITY

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.914	.896	23

INTERPRETATION:-

Cronbach'salphais theuttermostrecurrentcomputereferringtointernalconsistency('correctness').This ismaxoftenusedduringseveralLikertquestioninginaninquiry/questionnaireschemesndrangeasa consequence we want to ascertain if this scale is decisive. This index indicatesthatthe reliability statistics of our questionnaire which was taken for this study. The minimum required Cronbach'sAlphaisThistableshowsthatthereliabilityforthisquestionnaireis0.914,whichisshowingthatour

questionnaire is reliable for this study.

Objective 1-

KMO and Bartlett's Test:-

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.777
Bartlett's Test of Sphericity	Approx. Chi-Square	7605.660
	Df	253
	Sig.	.000

Interpretation:-

The value of KMO is 0.777. As we know that KMO value which in between 0.7 to 0.8 show that applying factor analysis is appropriate for these data (see Hutcheson and Sofraniou, 1999, pp.224-225 for more details). Additionally as rule of thumb for factors analysis there should be at least 1:5 ratios between the number of variables and number of respondents.

Therefore we continue of our research with the ratio of 1:10 between number of variables and number of respondents.

Bartlett's test: - Bartlett's test of sphericity result show that original correlation matrix is an identical matrix.

Through the result, it is clear that matrix is an identified matrix therefore to establish relationship between variables and R matrix all correlation coefficient should be zero. From the result it is clear that significance value is 0.000 i.e. P is less than 0.001 (P<0.001). Therefore factor analysis is appropriate.

Bartlett test is highly significant (P<0.001).

Total variance explained:-

Total Variance Explained							
Component	Initial Eigen values			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	8.576	37.288	37.288	8.576	37.288	37.288	8.423
2	5.889	25.605	62.893	5.889	25.605	62.893	4.468
3	2.335	10.151	73.044	2.335	10.151	73.044	3.888
4	1.133	4.926	77.970	1.133	4.926	77.970	4.751
5	1.085	4.716	82.686	1.085	4.716	82.686	1.727
6	.918	3.991	86.677				
7	.477	2.075	88.752				
8	.460	2.002	90.753				
9	.387	1.682	92.435				
10	.324	1.409	93.844				
11	.287	1.247	95.091				
12	.278	1.210	96.301				
13	.192	.834	97.135				
14	.167	.728	97.863				
15	.115	.501	98.364				
16	.100	.435	98.799				

17	.071	.310	99.108				
18	.064	.280	99.388				
19	.049	.213	99.601				
20	.040	.172	99.773				
21	.023	.098	99.871				
22	.017	.074	99.945				
23	.013	.055	100.000				

Extraction Method: Principal Component Analysis.

a. When components are associated, sums of squared loadings cannot be united to attain a complete deviation.

INTERPRETATION

The total variance tally explains the results of the factor analysis and provides information on the number of factors containing the variables, knowing that the purpose of the factor analysis is to curtail the tally of variables as a factor dimension. The agenda below concludes with 23 variables grouped into 5 factors.

In general, to determine the number of factors, we use Eigen value criteria greater than 1. The result is a total of five factors. The first factor explains 37.288% of the variance. The second factor accounts for 25.605% of the variance. The third factor explains 10.151% of the variance. The fourth factor constitutes 4.926% of the variance. The fifth factor accounts for 4.716% of the variance.

This output SPSS 3 details the Eigen values joined along one by one linear component (factor) afore extraction, after extraction and after rotation.

Back SPSS extraction was finded, 23 linear components were identified in the dataset, knowing that there must be an equal number of Eigen vectors and variables, so that there are an equal number of variables and factors. As in the result, the Eigen value linked by each other concern to the factors describes the deviation elucidated by the respective linear component. Consequently, SPSS too declared the Eigen value using the declared percentage deviation.

We can therefore deduce from the table that factor 1 explains 37.288% of the total variance. From the table it is also clear that some factors explained a relatively large deviation, while other successive factors explained a small deviation. At the end of the SPSS extracts, the factors with an Eigen value are greater than 1, that is, there are only 5 factors left. As a result, the deviation percentages declared in the columns are indicated as amounts in the square.

The value in the second part, i.e. the squeeze-out amounts, will be the same as the value before the extraction, except that the rejected values of less than 1 will be discounted.

In the last lot of refer to index (rotation sum of the load in the square). The Eigen values of the pointed later after the rotation are put on display. The rotation results in optimizing the factor structure and comparing the relative importance of the data of the five factors. Before rotation, factors 1 had more variance than the other 4 factors (25,605, 10,151, 4,926 and 4,716). However, after extraction all factors are equal.

Communalities

	Initial	Extraction
Facilitation and equipments of Delhi Metro is quite good.	1.000	.571
Seats are in good conditions.	1.000	.593
In Metro we experience smooth ride.	1.000	.795
Metro has a huge passenger's capacity.	1.000	.790
The interior, seals and windows of the Delhi metro is clean and Tidy.	1.000	.679
The platform and the exterior of the metro is clean and hygienic.	1.000	.868
Machine and service of the metro are in good condition i.e. Nitration due to machine does not occur.	1.000	.616
Adequate number of metro in available in this route.	1.000	.760
Personnel employed as staffs are well dressed neat and tidy.	1.000	.791
Generally waiting time of Delhi metro is less and frequency of Metro is adequate.	1.000	.907
Metro has a sound speed and it takes less time to travel.	1.000	.930
Personnel/staff is very helpful and solve our problems when needed.	1.000	.873
Staffs are always available to solve our problem and make the Process fast.	1.000	.851
Staffs always understand the needs and requirement of the Passengers.	1.000	.900
Employees possess courtesy and are disciplined.	1.000	.935
Drivers are having expertise in driving the metro.	1.000	.903
Metro travelling is safer than other public transport.	1.000	.777
Metro is having better security system than other public Transportation.	1.000	.917
Traffic rules are very friendly and easy going.	1.000	.917
Travel through source to destination is problem free and Comfortable.	1.000	.916
Metro has cleanliness regarding their graffiti.	1.000	.948
Temperature inside the metro is very comfortable and climate Friendly.	1.000	.879
Passengers are having good behavior and do not quarrel with Each other i.e. they posses safer behavior.	1.000	.903

Extraction Method: Principal Component Analysis.

Interpretation:-

SPSS output manifests the enumeration peculiar to output in spss principle component anatomy output tasks over the rudimentary supposition that all variance prevalent; thence the value of communalities are altogether 1 before extraction. The communalities in output Extraction shows that common deviation in the data structure. So considering exemplification, in first question 57.1 % variance associated is common, or we can say that these communalities is in terms of the proportion of variance define by the respectivefactors.

Component Matrix[a]

	Component				
	1	2	3	4	5
Facilitation and equipment of Delhi Metro is quite good.	.609	-.389	-.072	-.158	.127
Seats are in good condition.	.809	-.264	-.256	-.203	.153
In Metro we experience smooth ride.	.466	.527	-.216	-.109	.112
Metro has a huge Passenger's capacity.	.714	.377	.102	-.219	.369
The interior, seals and windows of the Delhi Metro is clean and tidy.	.662	-.318	.197	.389	.059
The Platform and the exterior of the metro is clean and hygienic.	.763	-.362	.341	.232	-.176
Machine and service of the metro are in good condition i.e. nitration due to machine do not occur.	.353	-.179	.137	.787	-.292
Adequate number	.227	-.054	.104	.190	.734
Personal employed as staffs are well dressed neat and tidy.	.383	.003	.732	.071	-.012
Generally waiting time of Delhi metro is less and frequency of metro is adequate.	.438	.144	-.158	-.102	.695
Metro has a sound and it takes less time to travel.	.305	.168	-.288	.121	.530
Personnel/staff is very helpful and solve our problems when needed.	.185	.108	.471	-.107	.759
Staffs are always available to solve our problem and make the process fast.	.245	.494	.196	-.125	.883
Staffs always understand the needs and requirement of the passengers.	.490	.833	.451	-.195	.067
Employees possess courtesy and are disciplined.	.332	.334	.531	-.186	-.015
Drivers are having expertise in driving the metro.	.369	.454	.653	-.268	-.182
Metro travelling is safer than other public transport.	.411	.383	-.356	.620	-.212
Metro is having better security system than other public transportation.	.337	.056	-.074	.597	-.309
Traffic rules are very friendly and easy going.	.492	.764	.176	.039	.148
Travel through source to destination is problem free and comfortable.	.329	.268	.219	.860	.009
Metro has cleanliness regarding their graffiti.	.692	.150	-.121	.103	.239

Temperature inside the metro is very comfortable and climate friendly.	.135	.680	-.290	.261	.203
Passengers are having good behavior and do not quarrel with each other i.e. they posses safer behavior.	.246	.585	.050	.489	.444

Interpretation:-

This is the output of component matrix before rotation. In this matrix contains the all loading of 23 variables on to five factors. In SPSS all loadings are displayed but those loadings which are less then o.5

is suppressed in the output in this stage SPSS has extracted five factors. This criteria is accurate when there are less than 30 variable.

According to this table there are five factors Tangibility, Empathy, Assurances, Reliability, and Responsiveness.

Table of variables grouped in to five factors:-

Factor No.	Name of Dimension	Variable No.	Variables	Factor Loading
F1	Tangibility	1	Facilitation and equipment of Delhi Metro is quite good.	0.609
		2	Seats are in good condition.	0.809
		4	Metro has a huge Passenger's capacity.	0.714
		5	The interior, seals and windows of the Delhi Metro is clean and tidy.	0.662
		6	The Platform and the exterior of the metro is clean and hygienic.	0.763
		21	Metro has cleanliness regarding their graffiti.	0.692
F2	Empathy	14	Staffs always understand the needs and requirement of the passengers.	0.833
		22	Temperature inside the metro is very comfortable and climatefriendly.	0.680
		23	Passengers are having good behavior and do not quarrel with each other i.e. they posses safer behavior	0.585
		3	In Metro we experience smooth ride.	0.527

		19	Traffic rules are very friendly and easy going.	0.764
F3	Assurance	15	Employees possess courtesy and are disciplined.	0.531
		16	Drivers are having expertise in driving the metro.	0.653
		9	Personnel employed as staffs are well dressed neat andtidy.	0.732
F4	Reliability	7	Machine and service of the metro are in good condition i.e. nitration due to machine do not occur.	0.787
		17	Metro travelling is safer than other public transport.	0.620
		18	Metro is having better security system than other public transportation.	0.597
		20	Travel through source to destinationis problem free and comfortable.	0.860
F5	Responsiveness	10	Generally waiting time of delhi metro is less and frequency of metro is adequate.	0.695
		11	Metro has a sound and it takes less time to travel.	0.530
		13	Staffs are always available to solve our problem and make the process fast.	0.883
		8	Adequate number of metro in available in this route.	0.734
		12	Personnel/staff is very helpful and solve our problems when needed.	0.759

Explanation:-

1. The first factor is Tangibility in which variable no. 1,2,4,5,6,21 are grouped i.e. 6 variablesare under Tangibility.

2. The second factor is Empathy in which variable no. 14, 22, 23,3,19 are grouped i.e. 5variables are underEmpathy.

3. The third factor is Assurance in which variable no. 15, 12, 9 are grouped i.e. 3 variables areunder Assurance.

4. The fourth factor is Reliability in which variable no. 7, 17, 18, 20 are grouped i.e. 4 variablesare under Reliability.

5. The fifth factors isResponsiveness in which variable no. 10, 11, 13, 8, 12 are groupedi.e. variables are under Responsiveness.

Objective 2-

R-Square and Adjusted R-Square Model Synopsis

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.977[a]	.955	.954	.229

a. Predictors: (Constant), Responsiveness, Empathy, Reliability, Assurance, Tangible

Interpretation:-

In this table the value of R2 is 95.5 %. R-square determines how data justifies regression line. It is also termed as coefficient of determination .The value of R-square represent the percentage variance in dependent variable explains by various independent variables. According to this output, 95.5 % of the independent variable is capable to explain dependent variable in a significant manner.

Adjusted R Square: - Adjusted R square will always be less than or equal to R2. The value of R2 is95.4 %. R square shows the fitness of the curve. If we add more unwanted variable to a modal the value of adjusted R square decreases but adding useful variables adjusted R square increases. According to this table 95.4 % of the variables fit the model. Here adjusted R square is used because we are working on sample and later it is to be generalized.

ANOVA

ANOVA[a]

Model		Sumof Squares	Df	Mean Square	F	Sig.
1	Regression	258.812	5	51.762	988.696	.000[b]
	Residual	12.251	234	.052		
	Total	271.063	239			

Interpretation:-

Anova Accesses the overall significant of the model. If P<0.05 than model is significant and fit. Here in this table the sig. value of all the independent variable is less than 0.005 as it is 0.000. Therefore all the independent variable is accepted and gives an impact on overall service quality

Coefficient

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	.440	.169		2.607	.000

1	Tangible	.556	.139	.446	2.678	.000
	Empathy	.364	.068	.323	9.664	.000
	Assurance	.132	.055	.106	.578	.000
	Reliability	.863	.137	.830	6.283	.000
	Responsiveness	.112	.030	.990	.390	.000

Interpretation:-

According to this table the standardized Beta Coefficient accords an assess about the grant out of any and every variable in the dummy.

In this table the independent variable value of standard coefficient indicate that unit change in the predicator variable gives a impact on overall service quality. All the five predictor contribute to the overall service quality positively as the value of beta of all the predictors arepositive.

Reliability has a greatest impact on the overall service quality as the reliability (beta) is 0.830 and other independent variable (Tangible, Empathy, Assurance, Responsiveness) has less impact as the value of unstandardized coefficient is 0.556, 0.364, 0.132, 0.112 respectively.

The equation of multiple regressions so derived is:-

Y = 0.440+0.556 X1+0.364 X2 +0.132 X3 +0.863 X4 +0.112 X5

Y= Dependent variable (Overall Service quality of Delhi Metro)

X1= Independent variable (Tangibility) X2= Independent variable (Empathy) X3= Independent Variable (Assurance) X4= Independent Variable (Reliability)

X5= Independent Variable (Responsiveness)

VII FINDINGS-

Male passengers used more the service of Delhi Metro as compare to female passengers. Number of passengers who uses the Delhi metro is generally the frequent user of Delhi Metro. Passengers having income below 50000 use the service of Delhi metro.

Passengers laying in the SEC code A2 uses more the service of Delhi metro, others also use the service but SEC code A2 uses more.

Objective 1 –

1. There are five dimension of service quality of Delhi metro. They are reliability, tangibility, empathy, assurance,responsiveness.
2. Tangibility factor is the max paramount point in utilitychoiceness.

Objective 2-

1. All the dimension of service quality contributes in the overall service quality ofDelhimetro.
2. Reliability has a better impact over service quality on Delhi metro among other service quality dimension.

VIII LIMITATIONS OF THE RESEARCH PAPER-

1. It was seen that some respondents were biased while filling the questionnaire.
2. Available literature and secondary data is less in Indiancontext.
3. Time constraint is measure limitation as it limits the area andtime.
4. Sample size is small as per the number of passengers who avail the service is in millions,for accurate information large sample size isdesired.
5. This research report does not represent the all metro stations of Delhi nor region. Survey from each service avails are notpossible.
6. We have taken 23 items for solving the problem. These items and factors/criteria can be varying in developed and underdeveloped economies. The referred scale is confined to the developed economy. Hence, there may be variation in number of items or factors in other less developed economies.
7. For deep information's more questions were needed but as per passengers time constraints limited questions were included inquestionnaires.
8. Due to the time constraints only few articles and journal were studied in theresearch.

IX RECOMMENDATIONS

Delhi Metro has to improve the service quality of the Delhi Metro. Responsiveness and empathy has to be given more attention. Safety of female should be taken into due consideration as female is less user of Delhi Metro. The waiting times of metro in some stations are more so more metros should be given in those areas. In some areas of Delhi metro facilities should beadded.

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