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WIRELESS TELEPHONE SERVICES IN INDIA– AN APPRAISAL OF SERVICE QUALITY

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Abstract:

The Indian telecommunication industry is one of the world's fastest growing industries. It is also the second largest telecommunication network in the world in terms of number of wireless connections after China. The first National Telecom Policy was announced by the Government in 1994 (NTP-94) with the objectives of providing telephone on demand, provision of world class services at reasonable prices and universal availability of basic telecom services to all villages. NTP-1994 recognized that the required resources for achieving these targets could not be made available only out of Government sources and private investment and involvement of the private sector was required to bridge the large resource gap. Entry of private sector payers in telecommunication sector has introduced the concept of service quality to the service providers as well as the subscribers. The present article is an attempt to make an assessment of service quality for the wireless telephone services in respect of selected telecom service providers with the help of service quality parameters based on SERVOQUAL Model.

KEY WORDS: TELECOMMUNICATION, WIRELESS TELEPHONE, QUALITY OF SERVICE, TANGIBILITY, RELIABILITY, EMPATHY.

Introduction:

As the fastest growing telecommunications industry in the world, it is projected that Indian economy will have 1.159 billion mobile subscribers by 2013. Furthermore, projections by several leading global consultancies indicate that the total number of subscribers in India will exceed the total subscriber count in the China by 2013. The industry is expected to reach a size of INR 344,921 crore (US$76.92 billion) by 2012 at a growth rate of over 26 per cent, and generate employment opportunities for about 10 million people during the same period. According to analysts, the sector would create direct employment for 2.8 million people and for 7 million indirectly. In light of these facts, it can be well argued that telecommunication, mobile industry in particular holds a key position for the overall development of India as a whole in near future. The Department of Telecommunication along with regulator, Telecom Regulatory Authority of India is taking various steps to bolster the growth of telecom sector and meet its targets.

Wireless systems and services have undergone a remarkable development since the first cellular and cordless telephone systems were introduced in the early 1980s. First generation cellular and cordless telephone systems were based on analog FM technology and designed to carry narrow-band circuit switched voice services. Second generation cellular and cordless telephone systems were introduced in the early 1990s that use digital modulation, and offer improved spectral efficiency, and voice quality. However, these second generation systems are still used for narrow-band voice and data services. Third generation wireless systems, currently under development that offer substantially higher bit rates ranging from 9.6 kb/s for satellite users, 144 kb/s for vehicular users, 384 kb/s for pedestrian users to 2.048 Mb/s for indoor office environments. These systems are intended to provide voice, data, the more bandwidth intensive multimedia services, while satisfying more stringent availability and quality of service (QoS) requirements in all type of environment. Fourth generation systems are also on the horizon that will provide broadband wireless access with asymmetric bit rates that approach 1 Gb/s.

Mobile telephone service has offered many value added services such as (mobility, memory, better connectivity, easy to handle, and many more such as SMS, call identification and many more highly useful to the subscribers) as compared to the landline telephone service. Mobile phone number portability is the recently value added feature for the service providing an opportunity to the subscribers to switch over from one subscriber to another if not satisfied with the quality of service. The added features of the service have been helpful in widening the subscriber base of different service providers offering mobile telephone services in the country. The subscriber base of basic wireless services is continuously increasing in India and the information has been presented in Table 1.

TABLE: 1

SUBSCRIBER BASE OF BASIC WIRELESS TELEPHONE CONNECTIONS

Year	Subscriber Base (Million)	Increase/Decrease	% age Change
2000-01	3.58	---	---
2001-02	6.54	2.96	82.68
2002-03	13.0	6.46	98.78
2003-04	33.69	20.69	159.15
2004-05	52.22	18.53	55.00
2005-06	90.14	37.92	72.62
2006-07	165.11	74.97	83.17
2007-08	261.07	95.96	58.12
2008-09	391.76	130.69	50.06
2009-10	584.32	192.56	49.15

Source: Annual Report of Telecom Regulatory Authority of India, Various Issues.

The subscriber base for wireless services was 3.04 Million for the financial year 2000-01 and is continuously increasing since then. The wireless subscriber base was 584.32 million as on 31st March 2010 in comparison to the subscriber base of 391.76 million as on 31st March 2009. It added 192.56 million subscribers in the financial year 2009-10 registering an annual growth rate of about 49.15 percent. The total subscriber of wireless has grown from 3.04 Million in March 2000-01 to 584.32 million in March 2010. The subscriber base of wireless services is increasing at a fast rate in the country. This shows the increasing importance of the wireless services in the country and expecting quality services from the service provider is quite important.

REVIEW OF LITERATUE AND RESEARCH METHODOLOGY:

Several studies have been conducted covering various dimensions of telecom sector. Brief review of some of the studies is presented here.

Palkar Apoorva (2004) explored the influence of quality attributes of the service on customer satisfaction and payment equality, and determination of key quality elements that determine customer retention. With the help of primary data collected from 400 respondents. The questions to measure quality elements were investigated based on the five dimensions of SERVOQUAL Model and the service features of Mobile Telephony. Results of regression and factor analysis showed that quality attributes are the most important factors for postpaid users. Usage Pattern, Service Quality, and Billing were derived to be the most important factors, for prepaid users. It could be interpreted that because customers perceived accumulated quality,

changing their experience and evaluation for the quality continuously. Therefore, service provider should make quality indices, which they could objectively manage service quality by the criterion of business performance and make an effort to conduct the continuous quality management activity to evaluate quality indices.

Prashant Pravin (2004) surveyed the satisfaction level of mobile users across all GSM and CDMA service circles based upon a sample of 2217 mobile users spread across different circles. About 82 percent of the respondents were GSM subscribers and 18 percent were CDMA subscribers. Five broad areas which contribute to overall satisfaction such as presales/sales; network availability; performance; and reliability; customer care; value added services and billing integrity were taken for the purpose of study. Results showed that from the subscribers; point of view GSM and CDMA were just two similar means of communication. In the overall category, BPL was the numero uno with an overall satisfaction score of 7908 percent while HFCL at the bottom with a 57 percent score.

Revati S. and Padmavathy S. (2005) in their research article analyzed the awareness level among cellular service users; problem faced by the users and examiner the factors which influence the choice of cellular service providers. Null hypothesis for the study was that personal factors like age, gender, educational qualification occupational status and family income of users did not influence the preference for cellular service providers. Results showed that only age and family income influenced the customer decision while educational qualification, gender and occupational status had no impact over the choice for cellular service provider. On the other side problems faced by Aircel users were billing systems, delayed connectivity and single interruption in order while BPL cellular limited users faced firstly lack of coverage, secondly delayed connectivity and signal interruption was third. Article suggested that service providers should meet the global challenges by following sales promotion techniques to attract females, reduce their service charges, clear communication to illiterates through mass media.

Francis Sudhakar K. and Lydia Nutan (2005) studied the behavior of the mobile telephone users migrating from prepaid to postpaid and vice-versa. According to study, general perception about prepaid like economical, controlled expenditure, attractive schemes, enhance limited usage, etc. were the factors influencing the migration to prepaid from postpaid. While schemes and tariffs plans, more use of mobile service, need for additional services, availability

of corporate connection etc. were the factors influencing the migration to postpaid from prepaid. Results of the study show behavioral changes in usage pattern after migration from prepaid to postpaid be like the 90 percent of the respondents claimed that the usage behavior had not undergone any change.

Ganesham Malathi and N. M. Selvaraj (2005) studied the choice of brands among consumers and reasons for the same and studied the problems faced by the respondents with respect to mobile services. The study revealed that 90 percent of cell phone users were male, 73 percent of the respondents were satisfied with the mobile services, 30 percent of the respondents opines that billing pattern offered by the service provider was good, 44 percent of the respondents are motivated by their friends to avail the mobile services, 40 percent of the respondents agreed that cell phone was ac cheaper mode of communication.

Badhur Shampa (2005) discussed about TRAI's levy of ADC (Access Deficit Charges) on roaming calls. As per TRAI's calculations, national roaming users had to pay an ADC of Rs. 0.30 per minute, equivalent to the deficit charges on STD calls, while international roaming subscribers would have to pay Rs. 3.25 per minute. The Access deficit amount for all calls form roaming subscribers would have to be collected by the visited network operator and paid to BSNL. TRAI had amended the Telecommunication Interconnection Usage Charges Regulation, 2003. In the new sense, roaming would mean enchancing a cellular subscriber to automatically make and receive voice and data calls and access their services while traveling outside the geographic leverage area of the home network.

De Klundert, Kuiper Jeroen, Winkles Moarten (2005) in their study "Selecting Telecommunication Carriers to obtain Volume Discounts'" discussed that during 2001 many European markets for mobile phones reached saturation. Hence, mobile phone operators had shifted their focus from growth and market share to cutting costs. One way of doing so was to reduce expenditure on international calls, which were routed via network operation companies (carriers). These carriers charged per-call-minute for each destination and might use a discount on total business volume to price their services. A software system that supported decision on allocating destination to carriers was developed. The core of this system was a min-cost flow routine that was embedded in a branch-and-framework.

Panandikar Sanjeev and Rajput Rahul (2005) had a comparative study on service quality of mobile operators base upon a sample of 295 mobile service users. The questionnaire focused on parameter like service quality, service standards, customer expectation and company offerings. The multivariate analysis carried out in order to compare the cellular operator on the satisfaction levels of key quality elements. Sigma scaling was used to get more accurate values of consumers' perception. The result of the study showed that there was no significant difference in the customer satisfaction between prepaid and post paid consumers while the significant difference was found in the perception of prepped consumers with regard to meaning and understanding of service elements.

Pandit Rishati (2005) studied the promising alternative on which companies were relying heavily these days, Companies generated 4 to5 percent of its revenue through value added services. Among data services, excluding SMS and MMS, monophonic ring tones were of the most popular value added services, with an annual traffic of over 19 millions, while polyphonic tones and other downloads were fast catching up. Data services like wall papers, redingotes, and games were the fastest growing segments in the non-voice space. According to the study cellular data services were expected to account for 20.5 percent of total cellular services revenue in 2008 Equivalent to Rs. 147.6 billion. But to keep up this tempo, Operators needed to be innovative not just in providing value added services but also in pricing strategy.

Mittal Alok and Sirohi Prerna (2006) identified the important factors which young adult consumers in service and business class considered while selecting a cellular service provider. The study was based on exploratory research model or formative research study, where the role played by different factors in selection of cellular services was explored. Based on the respondents of 120 customers, it was found that there was a significant difference in selection of cellular services by customers in customers in service and business profession who were having age of 40 years and above, whereas there was no difference in selection of cellular services by customers of other segments.

Singal Prashant (2006) explored about the lifetime validity scheme launched by the telecom service providers. The article threw light on various ambiguous areas, such as "Lifetime" which itself was not clear. There needed to be clarity on other area whether we were referring to the lifetime of the consumers or the lifetime of the operator license. In case of GSM

handsets too, there was no clarity regarding replenishment to the consumers in case the Sim card got damged or aged. There was also no commitment by the operators to upgrade either the handsets or the services for lifetime validity customers. There was no clarity about changing the key performance indicators with the introduction of these schemes. Paper stated that telecom companies would have to provide more clarity on the plans and the regulator also needed to describe measures to protect the interest of consumers.

Pandey Shekhar Ravi (2006) studied the satisfaction level of the mobile usersbased on a sample of 3763 mobile users spread across different circles. Study had considered five broad areas that contribute to overall satisfaction-pr sale and post sale; network availability, performance and reliability, customer care, value added services and billing integrity. Study showed that there was considerable decline in the performance levels of five out of eleven operators whose customers participated in the survey. The TRAI benchmark (95 percent) remained as elusive as ever for all operators except BPL and MTNL. The worst performers had been Aircle and Tata Teleservices. Users in B/C circles remained the most dissatisfied lot. Customer satisfaction with billing actually went down. Except for Reliance Info comm., there was a significant decline in the satisfaction decline in the satisfaction of all operators. In the Metros, Value Added Services contributed the most (32 percent) to overall satisfaction. Study also showed that even overall customer satisfaction level improved, though by just under a percentage point, satisfaction with different service parameters hit a new low.

Data Collection and Analysis:

Primary data for research was collected with the help of the well structured questionnaires that especially designed to achieve the specific objectives of the study. The questionnaires focused on various aspects of the service quality measurement based on SERVOQUAL Model i.e., Tangibility, Reliability, Responsiveness, Empathy, Assurance, Economy, Technical Quality, and Imagination. The adequacy and relevance of the questions was tested by conducting the pilot survey covering thirty respondents each for the three questionnaires separately. Based upon the feedback on the pilot survey, the questionnaires were amended and were used for collecting primary data from the respondents i.e. the subscribers of wireless services. Public sector as well as private sector players are providing telecom services

with a dominant share of public sector players in terms of subscriber base. Respondents on the basis of service providers have also been selected to ascertain the level of satisfaction among subscribers foe the service providers namely BSNL, Idea, Reliance, Airtel, and Tata. Total of 80 for all the respondents of each of the selected service providers have been obtained for the different aspects affecting the service quality of wireless services. The selected data variables have been studied with the help of statistical techniques i.e., growth rate, percentage share, and regression analysis.

BREIF PROFILE OF THE RESPONDENTS:

Demographic variables affect the decision making aspect of the person and accordingly the usage of goods, services and their relevance for them in their personal and professional life. Use of mobile services may be directed to meet the personal need of communication. Nowadays mobiles are increasingly used for speedy flow of information for the professional requirements. Brief description of the demographic variables about the respondents has been provided so as to know the classified information about the respondents.

Gender Wise Classification

Since, Indian economy is considered as male dominated society in terms of decision making process. Gender wise classification of wireless users has been listed in Table 2.

TABLE: 2

GENDER-WISE CLASSIFICATION

Gender Company	Male		Female		Total
	N	%age	N	%age	
AIRTEL	26	32.50	54	67.50	80
BSNL	30	37.50	50	62.50	80
IDEA	53	66.25	27	33.75	80
RELIANCE	53	66.25	27	33.75	80
TATA	41	51.25	39	48.75	80
Total	203		197		400

Gender wise analysis indicates the usage of mobile services across both groups classified on the basis of gender of the respondents, the distribution of respondents across both groups

indicates more usage of wireless services by male group respondents in comparison to female groups.

Age Wise Classification

In the daily life age level affects the usage of goods and services. The age wise classification of wireless users has been listed in Table 3.

TABLE: 3

AGE-WISE CLASSIFICATION

Age (Years) Company	20-30		30-40		40 and above		Total
	N	%age	N	%age	N	%age	
AIRTEL	31	38.75	34	42.50	15	18.75	80
BSNL	13	16.25	34	42.50	33	41.25	80
IDEA	29	36.25	36	45.00	15	18.75	80
RELIANCE	26	32.05	22	27.50	22	27.50	80
TATA	33	41.25	24	30.00	23	28.75	80
Total	132		150		108		400

Age wise analysis indicates the usage of mobile services across different age groups classified on the basis of age of the respondents, the distribution of respondents across different categories of age wise indicates more usage of mobile services by 30-40 age group respondents in comparison to other age groups.

Occupation Wise Classification

Level of occupation affects the usage of goods and services. The occupation wise classification of wireless users has been listed in Table 4

TABLE: 4

OCCCUPATION-WISE CLASSIFICATION

Occupation Company	Professionals		Students		Businessmen		Others		Total
	N	%age	N	%age	N	%age	N	%age	
AIRTEL	37	46.25	12	15.00	24	30.00	7	08.75	80

BSNL	45	56.25	8	10.00	23	28.75	4	05.00	80
IDEA	36	45.00	6	07.50	27	33.75	11	13.75	80
RELIANCE	17	21.25	17	21.25	27	33.75	19	23.75	80
TATA	34	42.50	14	17.50	22	27.50	10	12.50	80
Total	169		57		123		51		400

Occupation wise analysis indicates the usage of mobile services across different groups classified on the basis of occupation level of the respondents, the distribution of respondents across different categories of occupation level indicates more usage of wireless services by professional and businessman respondents in comparison to other categories.

Income Wise Classification

Level of income affects the affordability for goods and services. The income wise classification of mobile users has been listed in Table5.

TABLE: 5

INCOME-WISE CLASSIFICATION

Income (Rs.) \ Company	Below 10000		10000-25000		25000-50000		Above 50000		Total
	N	%age	N	%age	N	%age	N	%age	
AIRTEL	22	27.50	28	35.00	29	36.25	1	01.25	80
BSNL	13	16.25	26	32.50	38	47.50	3	03.75	80
IDEA	25	31.25	36	45.00	19	23.75	-		80
RELIANCE	33	41.25	27	33.75	18	22.50	2	02.50	80
TATA	24	30.00	20	25.00	18	22.50	18	22.50	80
Total	117		137		122		24		400

Income wise classification of the respondents indicates that mobile facility is being used by respondents from all levels of income category. Though, the proportion of users seems to be high in high middle income group people. So, it may be concluded that wireless telephone facility is widely used across by various income groups.

Qualification Wise Classification

Education plays an important role in deciding the employment and job description. Mobile services are considered as the service mainly used by relatively highly educated people for the

speedy flow of information. Qualification Level affects the affordability for goods and services. The qualification wise classification of mobile users has been listed in Table 6.

TABLE: 6

QUALIFICATION-WISE CLASSIFICATION

Qualification / Company	Senior Secondary		Graduates		Post-Graduates		Professionals		Total
	N	%age	N	%age	N	%age	N	%age	
AIRTEL	2	2.5	27	33.75	27	33.75	24	30	80
BSNL	4	5	14	17.5	43	53.75	19	23.75	80
IDEA	7	8.75	17	21.25	27	33.75	29	36.25	80
RELIANCE	10	12.5	28	35	23	28.75	19	23.75	80
TATA	13	16.25	17	21.25	35	43.75	15	18.75	80
Total	30		103		155		106		400

Qualification wise analysis indicates the usage of mobile services across different groups classified on the basis of education level of the respondents, the distribution of respondents across different categories of education level indicates more usage of mobile services by post graduate and graduate respondents in comparison to other categories.

ASSSESSMENT OF SERVICE QUALITY:

The quality of services has been evaluated with the help of selected variables of SERVQUAL Model. The model is based on the study of eight parameters namely **Tangibility, Reliability, Responsiveness, Empathy Assurance, Economy, Technical Quality, Imagination.** Regression model has been applied to ascertain the determinant of service quality for the selected service providers. Overall service quality has been taken as dependent variable while different quality parameters have been taken as independent variables affecting the service quality.

ASSSESSMENT OF SERVICE QUALITY OF AIRTEL

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate

1	.377(a)	.142	.045	.54684

a Predictors: (Constant), IMG, ASS, EMP, TEQ, TAN, REL, ECO, RES

From the above table, it can be analyzed that the value of R is 0.377 which show the influence of independent variable i.e tangibility, accessibility, responsiveness, empathy, reliability, economy, technical ability and imagination on the overall satisfaction factors of Airtel customer. The value of R^2 is 0.142 means 14.2% variation of dependent variable, overall Airtel customer satisfaction factor, accounted for by the independent variable i.e. tangibility, accessibility, responsiveness, empathy, reliability, economy, technical ability and imagination in the regression model. And adjusted R^2 is 0.045 which has taken into consideration each new independent variable brings to the regression model. Standard error of estimate is 0.54684 show the dispersion of observed values around the regression line as this value is less than 1 so it can be analyzed that data are relatively close to the regression line and regression equation can be used to predict dependent variable with little error.

ANOVA (b)

Model		Sum of Squares	df	Mean Square	F-value	Sig. level
1	Regression	3.518	8	.440	1.471	.183(a)
	Residual	21.232	71	.299		
	Total	24.750	79			

a Predictors: (Constant), IMG, ASS, EMP, TEQ, TAN, REL, ECO, RES

b Dependent Variable: OVERALL

For finding the significance predictor ANOVA test has been applied and following null hypothesis has been formulated:

Ho: there is no significance predictor of overall Airtel customer satisfaction factor.

As given in the table, F calculated value is 1.471 and significance value is 0.183 which is more than 0.05. So, it can be concluded that there is at least one significance predictor of overall Airtel Customer satisfaction factor.

Coefficients (a)

Model		Unstandardized Coefficients	Standardized Coefficients	T-value	Sig. Level

		B	Std. Error	Beta		
1	(Constant)	3.079	.476		6.467	**.000***
	Tangibility	.112	.108	.135	1.036	.304
	Assurance	.238	.097	.342	2.456	**.016***
	Responsiveness	-.016	.106	-.023	-.154	.878
	Empathy	-.050	.090	-.074	-.552	.582
	Reliability	-.025	.096	-.035	-.260	.796
	Economy	-.058	.105	-.073	-.551	.583
	Technical Quality	-.026	.086	-.040	-.302	.763
	Imagination	.103	.091	.155	1.132	.261

a Dependent Variable: OVERALL

Note: * indicates T-value significant at 5% Level of Significance.

The results of the linear regression analysis indicate that the overall satisfaction level of the consumers is not affected by the selected variable to the similar tune. The values are statistically significant in respect of Assurance at 5% level of significance. Other variables do not have significant impact on overall satisfaction level of the customers concluding, all the selected variables are not equally important in explaining the level of satisfaction of the customers.

ASSSESSMENT OF SERVICE QUALITY OF BSNL

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.345(a)	.119	.020	.36416

a Predictors: (Constant), IMG, REL, ASS, EMP, RES, ECO, TAN, TEQ

From the above table, it can be analyzed that the value of R is 0.345 which show the influence of independent variable i.e tangibility, accessibility, responsiveness, empathy, reliability, economy, technical ability and imagination on the overall satisfaction factors of BSNL customer. The value of R^2 is 0.119 means 11.9% variation of dependent variable, overall BSNL customer satisfaction factor, accounted for by the independent variable i.e. tangibility, accessibility, responsiveness, empathy, reliability, economy, technical ability and imagination in the regression model. And adjusted R^2 is 0.020 which has taken into consideration each new independent variable brings to the regression model. Standard error of estimate is 0.36416 show the dispersion of observed values around the regression line as this value is less than 1 so it can

be analyzed that data are relatively close to the regression line and regression equation can be used to predict dependent variable with little error.

ANOVA (b)

Model		Sum of Squares	df	Mean Square	F-value	Sig. level
1	Regression	1.272	8	.159	1.199	.312(a)
	Residual	9.416	71	.133		
	Total	10.688	79			

a Predictors: (Constant), IMG, REL, ASS, EMP, RES, ECO, TAN, TEQ

b Dependent Variable: OVERALL

For finding the significance predictor ANOVA test has been applied and following null hypothesis has been formulated:

Ho: there is no significance predictor of overall BSNL customer satisfaction factor.

As given in the table, F calculated value is 1.199 and significance value is 0.312 which is less than 0.05. So, it can be concluded that there is at least one significance predictor of overall Airtel Customer satisfaction factor.

Coefficients (a)

Model		Unstandardized Coefficients		Standardized Coefficients	T-value	Sig. Level
		B	Std. Error	Beta		
1	(Constant)	3.346	.375		8.932	**.000***
	Tangibility	-.043	.087	-.080	-.498	.620
	Assurance	-.041	.068	-.081	-.602	.549
	Responsiveness	.078	.081	.162	.965	.338
	Empathy	-.054	.076	-.114	-.708	.482
	Reliability	.070	.079	.140	.885	.379
	Economy	.049	.073	.102	.667	.507
	Technical Quality	.018	.090	.045	.198	.843
	Imagination	.096	.091	.197	1.046	.299

a Dependent Variable: OVERALL

Note: * indicates T-value significant at 5% Level of Significance.

Ho: Constant factor contributes not significantly in linearly predicting the overall BSNL customer satisfaction factor.

Results: at α = 0.05, the null hypothesis is accepted, as p value is more than 0.05.

ASSSESSMENT OF SERVICE QUALITY OF IDEA

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.589(a)	.347	.274	.61165

a Predictors: (Constant), IMG, TEQ, TAN, EMP, ASS, ECO, REL, RES

From the above table, it can be analyzed that the value of R is 0.589 which show the influence of independent variable i.e tangibility, accessibility, responsiveness, empathy, reliability, economy, technical ability and imagination on the overall factors of customer satisfaction. The value of R^2 is 0.347 means 34.7% variation of dependent variable, overall customer satisfaction factor, accounted for by the independent variable i.e. tangibility, accessibility, responsiveness, empathy, reliability, economy, technical ability and imagination in the regression model. And adjusted R^2 is 0.274 which has taken into consideration each new independent variable brings to the regression model. Standard error of estimate is 0.61165 show the dispersion of observed values around the regression line as this value is less than 1 so it can be analyzed that data are relatively close to the regression line and regression equation can be used to predict dependent variable with little error.

ANOVA (b)

Model		Sum of Squares	df	Mean Square	F-value	Sig. level
1	Regression	14.125	8	1.766	4.720	.000(a)
	Residual	26.562	71	.374		
	Total	40.687	79			

a Predictors: (Constant), IMG, TEQ, TAN, EMP, ASS, ECO, REL, RES

b Dependent Variable: OVERALL

For finding the significance predictor ANOVA test has been applied and following null hypothesis has been formulated:

Ho: there is no significance predictor of overall customer satisfaction factor.

As given in the table, F calculated value is 4.720 and significance value is 0.000 which is less than 0.05. So, it can be concluded that there is at least one significance predictor of overall Customer satisfaction factor.

Coefficients (a)

Model		Unstandardized Coefficients		Standardized Coefficients	T-value	Sig. Level
		B	Std. Error	Beta		
1	(Constant)	2.773	.487		5.688	**.000***
	Tangibility	-.158	.091	-.184	-1.729	.088
	Assurance	-.060	.096	-.073	-.625	.534
	Responsiveness	.100	.105	.135	.957	.342
	Empathy	.006	.095	.008	.067	.947
	Reliability	-.080	.099	-.101	-.808	.422
	Economy	-.172	.097	-.219	-1.780	.079
	Technical Quality	.184	.089	.241	2.061	**.043***
	Imagination	.485	.096	.607	5.069	**.000***

a Dependent Variable: OVERALL

Note: * indicates T-value significant at 5% Level of Significance.

The results of the linear regression analysis indicate that the overall satisfaction level of the consumers is not affected by the selected variable to the similar tune. The values are statistically significant in respect of Technical Quality and imagination at 5% level of significance. Other variables do not have significant impact on overall satisfaction level of the customers concluding, all the selected variables are not equally important in explaining the level of satisfaction of the customers.

ASSSESSMENT OF SERVICE QUALITY OF RELIANCE

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.643(a)	.414	.348	.56650

a Predictors: (Constant), IMG, RES, TAN, REL, ECO, EMP, TEQ, ASS

From the above table, it can be analyzed that the value of R is 0.643 which show the influence of independent variable i.e tangibility, accessibility, responsiveness, empathy, reliability, economy, technical ability and imagination on the overall satisfaction factors of Reliance customer. The value of R^2 is 0.414 means 41.4% variation of dependent variable,

overall Reliance customer satisfaction factor, accounted for by the independent variable i.e. tangibility, accessibility, responsiveness, empathy, reliability, economy, technical ability and imagination in the regression model. And adjusted R^2 is 0.348 which has taken into consideration each new independent variable brings to the regression model. Standard error of estimate is 0.56650 show the dispersion of observed values around the regression line as this value is less than 1 so it can be analyzed that data are relatively close to the regression line and regression equation can be used to predict dependent variable with little error.

ANOVA (b)

Model		Sum of Squares	df	Mean Square	F-value	Sig. level
1	Regression	16.102	8	2.013	6.272	.000(a)
	Residual	22.785	71	.321		
	Total	38.887	79			

a Predictors: (Constant), IMG, RES, TAN, REL, ECO, EMP, TEQ, ASS

b Dependent Variable: OVERALL

For finding the significance predictor ANOVA test has been applied and following null hypothesis has been formulated:

Ho: there is no significance predictor of overall Reliance customer satisfaction factor.

As given in the table, F calculated value is 6.272 and significance value is 0.000 which is more than 0.05. So, it can be concluded that there is at least one significance predictor of overall Reliance Customer satisfaction factor.

Coefficients (a)

Model		Unstandardized Coefficients		Standardized Coefficients	T value	Sig. Level
		B	Std. Error	Beta		
1	(Constant)	1.058	.502		2.109	**.039***
	Tangibility	.185	.084	.212	2.198	**.031***
	Assurance	.013	.095	.017	.141	.888
	Responsiveness	.359	.087	.436	4.122	**.000***
	Empathy	.071	.081	.101	.874	.385
	Reliability	.036	.088	.043	.414	.680
	Economy	.062	.081	.078	.757	.452
	Technical Quality	.064	.078	.088	.828	.410
	Imagination	.006	.087	.008	.068	.946

Dependent Variable: OVERALL

Note: * indicates T-value significant at 5% Level of Significance.

The results of the linear regression analysis indicate that the overall satisfaction level of the consumers is not affected by the selected variable to the similar tune. The values are statistically significant in respect of Tangibility and Responsiveness at 5% level of significance. Other variables do not have significant impact on overall satisfaction level of the customers concluding, all the selected variables are not equally important in explaining the level of satisfaction of the customers.

ASSSESSMENT OF SERVICE QUALITY OF TATA

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.511(a)	.261	.178	.63041

a Predictors: (Constant), IMG, RES, TAN, TEQ, ECO, REL, EMP, ASS

From the above table, it can be analyzed that the value of R is 0.511 which show the influence of independent variable i.e. tangibility, accessibility, responsiveness, empathy, reliability, economy, technical ability and imagination on the overall satisfaction factors of TATA customer. The value of R^2 is 0.261 means 26.1% variation of dependent variable, overall TATA customer satisfaction factor, accounted for by the independent variable i.e. tangibility, accessibility, responsiveness, empathy, reliability, economy, technical ability and imagination in the regression model. And adjusted R^2 is 0.178 which has taken into consideration each new independent variable brings to the regression model. Standard error of estimate is 0.63041 show the dispersion of observed values around the regression line as this value is less than 1 so it can be analyzed that data are relatively close to the regression line and regression equation can be used to predict dependent variable with little error.

ANOVA (b)

Model		Sum of Squares	df	Mean Square	F-value	Sig. level
1	Regression	9.983	8	1.248	3.140	.004(a)
	Residual	28.217	71	.397		
	Total	38.200	79			

a Predictors: (Constant), IMG, RES, TAN, TEQ, ECO, REL, EMP, ASS

b Dependent Variable: OVERALL

For finding the significance predictor ANOVA test has been applied and following null hypothesis has been formulated:

Ho: There is no significance predictor of overall TATA customer satisfaction factor.

As given in the table, F calculated value is 3.140 and significance value is 0.004 which is more than 0.05. So, it can be concluded that there is at least one significance predictor of overall TATA Customer satisfaction factor.

Coefficients (a)

Model		Unstandardized Coefficients		Standardized Coefficients	T value	Sig. Level
		B	Std. Error	Beta		
1	(Constant)	1.504	.524		2.869	**.005***
	Tangibility	.006	.115	.006	.049	.961
	Assurance	-.053	.117	-.065	-.454	.651
	Responsiveness	.164	.101	.211	1.626	.108
	Empathy	-.028	.100	-.038	-.285	.776
	Reliability	.051	.096	.067	.529	.598
	Economy	.155	.107	.178	1.446	.152
	Technical Quality	.111	.099	.140	1.121	.266
	Imagination	.201	.107	.232	1.879	.064

a Dependent Variable: OVERALL

Note: * indicates T-value significant at 5% Level of Significance.

Ho: Constant factor contributes not significantly in linearly predicting the overall TATA customer satisfaction factor.

Results: at $\alpha = 0.05$, the null hypothesis is rejected, as p value is less than 0.05.

ASSSESSMENT OF SERVICE QUALITY OF THE SELECTED MOBILE PHONE SERVICE PROVIDERS

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.397(a)	.158	.140	.58107

a Predictors: (Constant), IMG, RES, TAN, ASS, EMP, REL, ECO, TEQ

From the above table, it can be analyzed that the value of R is 0.397 which show the influence of independent variable i.e tangibility, accessibility, responsiveness, empathy, reliability, economy, technical ability and imagination on the overall factors of customer satisfaction. The value of R^2 is 0.158 means 15.8% variation of dependent variable, overall customer satisfaction factor, accounted for by the independent variable i.e. tangibility, accessibility, responsiveness, empathy, reliability, economy, technical ability and imagination in the regression model. And adjusted R^2 is 0.140 which has taken into consideration each new independent variable brings to the regression model. Standard error of estimate is 0.58107 show the dispersion of observed values around the regression line as this value is less than 1 so it can be analyzed that data are relatively close to the regression line and regression equation can be used to predict dependent variable with little error.

ANOVA (b)

Model		Sum of Squares	df	Mean Square	F-value	Sig. Level
1	Regression	24.681	8	3.085	9.137	.000(a)
	Residual	132.017	391	.338		
	Total	156.697	399			

a Predictors: (Constant), IMG, RES, TAN, ASS, EMP, REL, ECO, TEQ

b Dependent Variable: OVERALL

For finding the significance predictor ANOVA test has been applied and following null hypothesis has been formulated:

Ho: there is no significance predictor of overall customer satisfaction factor.

As given in the table, F calculated value is 9.137 and significance value is 0.000 which is less than 0.05. So, it can be concluded that there is at least one significance predictor of overall Customer satisfaction factor.

Coefficients (a)

Model		Unstandardized Coefficients		Standardized Coefficients	T value	Sig. Level
		B	Std. Error	Beta		
1	(Constant)	2.472	.211		11.713	**.000***
	Tangibility	.010	.043	.012	.240	.810
	Assurance	.043	.041	.057	1.033	.302
	Responsiveness	.168	.042	.229	4.004	**.000***
	Empathy	.007	.038	.010	.186	.852
	Reliability	.001	.041	.002	.028	.978
	Economy	.016	.042	.021	.377	.706
	Technical Quality	.029	.038	.043	.768	.443
	Imagination	.130	.041	.177	3.182	**.002***

a Dependent Variable: OVERALL

Note: * indicates T-value significant at 5% Level of Significance.

The results of the linear regression analysis indicate that the overall satisfaction level of the consumers is not affected by the selected variable to the similar tune. The values are statistically significant in respect of Responsiveness and Imagination at 5% level of significance. Other variables do not have significant impact on overall satisfaction level of the customers concluding, all the selected variables are not equally important in explaining the level of satisfaction of the customers.

The respondents for the purpose of assessment of service quality have been selected from different age groups, income groups and use mobile services for varied purposes. Moreover, mobile services are provided by service providers from public sector and private sector. The service provider wise classification for assessment of service quality indicates that the rating of service quality parameters is different in respect of different service providers.

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