

DETERMINANTS OF INDIAN MOBILE TELECOMMUNICATION SERVICE QUALITY

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Abstract

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AMOS 25

Mobile telecommunication industry has revolutionized the world of communication and its impact has become more far reaching than ever before. These impacts are pronounced globally and more so in India. The Indian Mobile industry has progressed by leaps and bounds in the last decade and half. As per TRAI, the total number of mobile subscribers by the end of March 2018 was 1183.41 million, taking the tele-density to 91.09, of which the urban tele-density is a prodigious 168.17 and the rural tele-density is 58.67. The objective of this study was to assess what do customers perceive to be the key determinants of mobile communication provides' service quality and how do each one of them impacts the customer satisfaction.

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I. Introduction:

India is the second largest market for mobile communication services with the total number of mobile subscribers by the end of March 2018 was 1183.41 million, taking the tele-density to 91.09, of which the urban tele-density is a prodigious 168.17 and the rural tele-density is 58.67. This phenomenal growth has come in little over one and half decade.

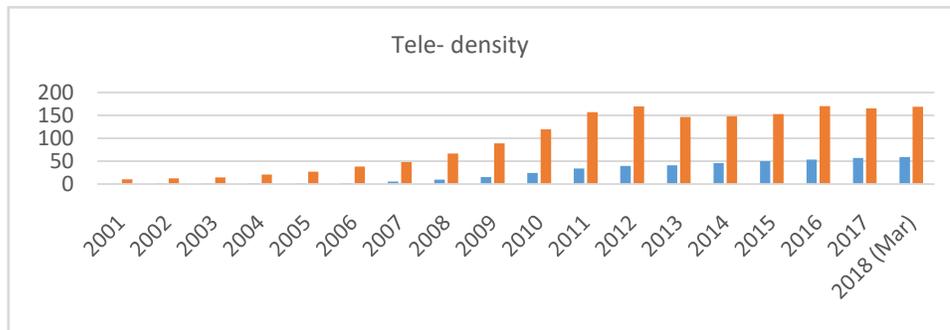


Figure I: Tele-density over the years (Source: compilation from TRAI subscriber reports.)

Currently, the Indian Mobile communication industry comprises of eight service providers. Their respective market share is shown in figure 2.

High penetration levels of the mobile service, is leading to intense competition amongst the players of this industry. To add to the woes of the mobile service operator is Mobile Network Portability (MNP). Launched in the year 2011, MNP enables a dissatisfied customer to change his/her operator without changing the mobile numbers.

Intense competition made acquiring new customers a tall task. This led to a drop in tariff rates. The result was decreased average revenue per user (ARPU). Thus, in spite of unprecedented growth in the mobile subscribers, the margins of the mobile service providers were declining quarter on quarter.

Error! Reference source not found. shows that while the mobile subscribers have been continuously growing (with the exception of the year 2012), the ARPU has not shown a similar

trend. The year 2016 which witnessed the launch of the disruptive new entrant Reliance Jio, plunged the ARPU lower than that in the year 2010. This was followed by tariff revision by various incumbent mobile services providers pushing the ARPU further south.

Access Service Provider-wise Market Shares in term of Wireless Subscribers as on 31st August, 2018



Figure 2: Market Share (Source: TRAI subscriber reports Nov'18)

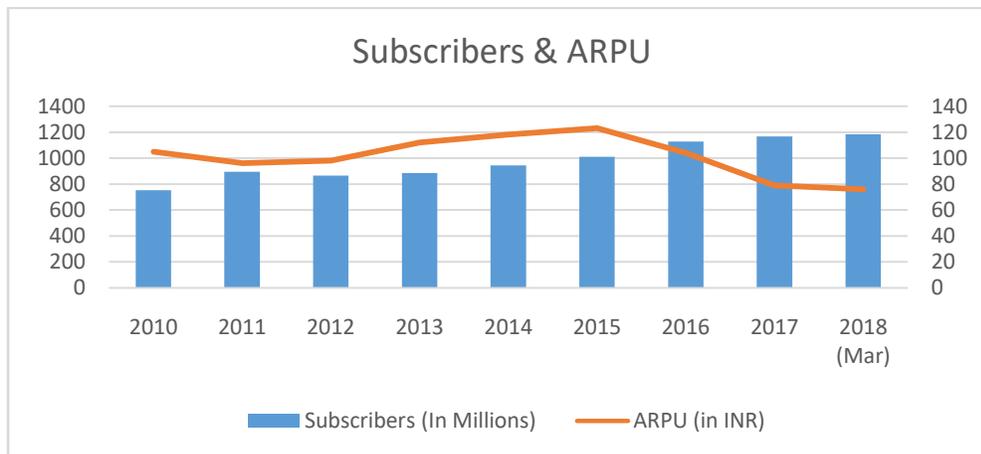


Figure 1: Subscribers and ARPU (Source: Compiled from TRAI performance reports)

High level of market penetration, MNP and presence of multiple mobile operators make it important for the companies to focus on service quality and loyalty to maintain its respective market share. Customer loyalty is all about attracting the right customers, getting them to purchase, purchase often, purchase in large quantities, and bring in more customers. It expresses the behavioral intention related to goods or services. Dawes and Swailes (1999) propounded that high customer loyalty is central to successful customer retention, and firms who compete on the

basis of loyalty will win over the battle of competition. Improving the service quality is key to creating customer satisfaction which leads to customer loyalty (Anderson & Mittal,(2000), Shah & Schaefer,(2005) and Sweeney & Swait,(2008))

Since service quality is the antecedent of customer satisfaction and customer loyalty, It is vital that mobile service providers deliver the best service quality to their customers. Thus it is imperative for the mobile communication industry to understand what constitutes service quality from customer's perspective. This study will investigate the various attributes of service delivery and yield those aspects of service delivery that are perceived by the customers critical to good service quality. Therefore this research intends to address the following two research questions:

RQ1: What do customers perceive to be the key determinants of mobile communication provides' service quality.

RQ2: Which service quality dimensions are most significantly associated with mobile communication customers' satisfaction?

II. Literature Review

Service Quality is one area that has been extensively researched and various scholars have developed their own opinions over more than three decades (Gronroos, 1984; Parasuraman, Zeithmal, & Berry, 1988; Cronin & Taylor, 1992; Frimpong & Boateng, 2014). Researchers have pointed out that providing high quality services is a key strategic tool to acquire competitive advantage (Liu, Guo, & Lee, 2011) and long term success (Santos, 2003; Zeithaml, Bitner, Gremler, & Pandit, 2013).To heightenservice quality, it is necessary to identify dimensions of service quality as perceived important by the customer.

Service literature shows various approaches to measuring service quality. Gronroos (1984)proposed that service quality should be conceptualized around the process of how the service delivered and the outcome of the delivery. Carman (1990) and Bolton & Drew (1991) viewed service quality as an overall assesment of service delivery and experience. Some other reseachers proposed that service quality is the extent to which services delivered by an organization meets the requirements of the customer. Numerous scholars define service quality

as the extent to which a service meets customers' expectations (Parasuraman, Zeithmal, & Berry, 1988; Cronin & Taylor, 1992; Teas, 1993)

Assessing the quality of service delivered, gives the organization an opportunity to identify the areas of improvement which leads to building competitive advantage. However, the fundamental characteristics of service, being intangible, inseparable and heterogeneous pose serious challenges in assessing the service quality (Zeithmal, Bitner, Gremler, & Pandit).

Service literature contains numerous tools that have attempted to overcome the challenges and assess the service quality. SERVQUAL developed by Parasuraman, Zeithmal, & Berry (1988) is a popular tool to assess the service quality. This 22 item scale measures the customer expectations and perceptions of service delivery across 5 dimensions namely:

- Tangibles: which is the service place, facilities and the appearance of service staffs
- Reliability: The ability to provide promised service to customers reliably and correctly
- Responsiveness: The will of service staffs to help customers and to provide real-time service
- Assurance: Service staffs are professional, polite and reliable
- Empathy: Companies care for the customers and provide some special attention.

However, SERVQUAL was questioned for about the need to measure expectations (Cronin & Taylor, 1992) for psychometric reasons. Scales directly measuring perceived performance relative to expectations have also been found to be less biased and more useful than scales merely measuring performance (Devlin, Susan, Dong, & Brown, 1993)

SERVPREF is another tool to measure service quality, developed by Cronin & Taylor (1992), which focused on the service performance. Sachdev and Verma (2004), in their assessment of the relative importance of quality dimensions in selective service industries, identified two perspectives of quality measurement: internal and external. While internal perspective is defined as zero defect or conformance to requirements, the external perspective understands service quality measurement in terms of customer perception, satisfaction, attitude, and delighting the customer

Mobile Service Quality

Relatively scant research has attempted to identify the determinants of the service quality for mobile services. Oodan, Ward, & Mullee (1997) reported assurance, availability, flexibility, reliability, security, and simplicity as quality criteria of concern to customers of telecommunications services. they further reported that the tendency in the past has been to treat network quality criteria in isolation and separated from other mentioned dimensions. From the customer's perspective, this is not as such desirable and also, unreasonable to expect customers to separate the network and non-network related quality requirements.

Wang & Lo (2002) used the approach of excluding the expectations measure in SERVQUAL but with added technical dimension of service quality to measure service quality of mobile service providers in China. Kim, Park, & Jeong (2004), have revealed three important facets of mobile service quality in the context of South Korean telecommunications service: call quality, value added services, and customer support. Seth, Momaya, & Gupta (2005), developed an instrument for assessing the service quality of cellular services comprising of technical quality along with the service delivery aspects. Lu, Zhang , & Wang (2004), have tested their proposed model of mobile service quality based on data collected from Chinese telecommunications brokerage service companies. They have derived and validated three key dimensions of mobile service quality, such as interaction quality, environment quality (how services are delivered to consumers, e.g. equipment), and outcome quality (the result of a service encounter, e.g. punctuality). Su (2014), proposed a conceptual framework derived from technical acceptance model. Based on the framework, they developed an instrument to measure perceived service quality of mobile data services. The service quality instrument consisted of six-dimensions: content quality, usability, reliability and speed, interaction, entertainment/enjoyment, and security/privacy.

In summary, service quality measurement plays an important role in studying the customers' perceptions regarding the quality of services offered by the service providers. The literature reviewed supports that the quality of services can be effectively measured with the help of service quality dimensions developed by the authors Parasuraman, Zeithaml and Berry (1988). However, some researchers have explored few additional dimensions to the original model of

SERVQUAL. Seth et al (2008) and Su(2014) have also developed new dimension of service quality viz – ‘Network Quality’ which examines technical quality of mobile services. Though there have been numerous research contributing to the theoretical and empirical study of service quality, they have confined their studies to different countries. They do not address the largest and the fastest growing telecom markets of the world – India (The Economist Intelligence Unit, 2017). Due to lack of studies in these markets, it is difficult to ascertain which of the service quality dimensions do customers’ perceive to be more important in their experiences and the overall evaluation of the service.

III. Methodology

Service quality was measured using the most popular SERVQUAL model exhibiting five dimensions – reliability, responsiveness, tangibility, assurance and empathy. The SERVQUAL model was developed by Zeithmal(Zeithaml, Berry, & Parasuraman, 1996). The extended SERVQUAL (Seth et al, 2008) instrument determines service quality structure along with technical quality (network clarity, coverage etc.) This has been adopted to assess the service quality of the mobile communication provider. Therefore the final instrument for 24 statements covering six dimensions- reliability, responsiveness, assurance, empathy, tangibility and technical quality, along with questions probing the demographics of the respondents. The instrument used in given in table 1.

Table 1:

Dimension	Code	Item
Reliability	Re1	Delivers the service as it had been promised
	Re2	Is dependable in solving customers’ problems
	Re3	Provides the right service(as you requested) in the first time itself
	Re4	Honors timelines in delivering the service
	Re5	Maintains error-free records(of usage, billing etc.)
Responsiveness	Res1	Keeps customers informed about when services will be performed(eg. Activating data
	Res2	Gives satisfactory service in critical times
	Res3	Is willing to help customers
	Res4	Readily responds to customers’ specific requirements

Assurance	A1	Behavior of employees (at call center or stores) instill confidence in customers
	A2	Employees (at call center or stores) make customers feel safe in their transaction
	A3	Employees (at call center or stores) are consistently courteous
	A4	Employees (at call center or stores) have appropriate knowledge to answer customer
Empathy	E1	Gives customers individual attention
	E2	Employees (at call center or stores) have the customer's best interest at heart.
	E3	Employees (at call center or stores) take genuine efforts in resolving customer com
	E4	Contact center/ store has business hours which are convenient to customers
Tangibility	T1	Stores are visually attractive
	T2	Has Modern and latest technology equipment.
	T3	Employees who have a neat, professional appearance
	T4	Visually appealing materials (SIM Kits, bill envelopes, posters etc) are associated
Technical Quality	Tech1	Has excellent Network coverage
	Tech2	Has excellent Network/ voice clarity
	Tech3	Provides high data speeds

In this study Proportionate Stratified Random sampling is used. The population of mobile consumers is divided into strata based on the Mobile communication provider (company) whose services are being used by the customers. The proportion of samples to be extracted from each strata is equal to the market share of each mobile communication provider. This ensures that customers of each mobile communication provider are adequately represented in the sample.

IV. Data Analysis

Reliability of the scale are measured by calculating the Cronbach's alpha. It measures how closely related a set of items are as a group. The Cronbach's alpha for instrument measuring service quality was 0.951 indicating good consistency and reliability.

Post the tests establishing the reliability of the constructs, factor analysis was done to confirm the factors of service quality.

Factor Analysis is a technique for modeling observed variables, and their covariance, in terms of a smaller number of underlying (latent) "factors." The factors typically are viewed as broad concepts or ideas that may describe an observed phenomenon. Factor analysis is used to identify groups of inter-correlated variables called factor. To check the factorability, either the values of correlation matrix should be greater than 0.3; values on anti-image correlation diagonals should be greater than 0.5

This study conducted the Factor Analysis using the Principal Component Analysis with Varimax rotation. In Principal Component Analysis, the total variance of the data is considered.

Table 2 KMO and Bartlett's Test – Service Quality

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.947
Bartlett's Test of Sphericity	Approx. Chi-Square	6288.873
	df	276
	Sig.	0.000

From the above table is observed that the Kaiser-Meyer-Olkin Measure of Sampling Adequacy is 0.947 which is greater than 0.5. Hence it is appropriate to apply factor analysis (Malhotra & Dash, 2016).

Table 3 Total Variance Explained- Service Quality Construct

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	11.134	46.393	46.393	11.134	46.393	46.393	5.005	20.855	20.855
2	1.970	8.209	54.603	1.970	8.209	54.603	4.538	18.909	39.764
3	1.437	5.990	60.592	1.437	5.990	60.592	2.829	11.788	51.552
4	1.101	4.586	65.178	1.101	4.586	65.178	2.675	11.146	62.698
5	1.078	4.076	69.254	1.078	4.076	69.254	1.574	6.557	69.254
6	.763	3.180	72.435						
7	.607	2.531	74.966						
8	.556	2.315	77.281						
9	.527	2.194	79.475						
10	.487	2.031	81.506						
11	.465	1.939	83.445						
12	.427	1.780	85.225						
13	.410	1.707	86.932						
14	.399	1.661	88.593						
15	.377	1.570	90.164						
16	.348	1.450	91.614						
17	.347	1.448	93.061						
18	.312	1.302	94.363						
19	.275	1.146	95.509						
20	.264	1.101	96.610						
21	.245	1.020	97.631						
22	.222	.923	98.554						
23	.187	.778	99.332						
24	.160	.668	100.000						

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %

Extraction Method: Principal Component Analysis.

From Table 3, it is observed that there are six factors extracted. The Eigen values of all the factors is greater than unity. Eigen values represent the amount of variance associated with the factor. Factors with Eigen values greater than one are retained. (Malhotra & Dash, 2016).

The first factor explains 46.3% of variance, followed by 8.2% variance being explained by factor 2. The cumulative variance percentage extracted by the factors should be greater than 60% (Malhotra & Dash, 2016). The factors extracted from table 4.5.2 account for 69.2% of cumulative variance.

Table.4 Factor Loadings- Service Quality Construct

	Component				
	1	2	3	4	5
Re2	.730				
Re4	.695				
Re3	.690				
Re1	.673				
Res3	.652				
Res4	.646				
Res2	.641				
Re5	.636				
Res1					
A1		.829			
A2		.781			
A3		.750			
A4		.727			
T2		.715			

	Component				
	1	2	3	4	5
T3		.629			
NwCoverage			.864		
NwClarity			.844		
DataSpeed			.775		
E2				.764	
E1				.713	
E4				.620	
E3				.617	
T1					.863
T4					.697
Extraction Method: Principal Component Analysis.					
Rotation Method: Varimax with Kaiser Normalization.					
a. Rotation converged in 6 iterations.					

Table 4 indicates the factor loadings of items on respective factors. Although factor loadings values 0.50 (Positive or Negative) are generally considered necessary for practical significance (Hair, Black, Babin, & Anderson, 2016). The present study factor loadings values 0.60 and above only are considered for further analysis.

Items Re1, Re2, Re3, Re4, Re5, Res2, Res3 and Res4 with factors loadings from 0.636 to 0.739 load onto factor1. All these items measure the ability of the mobile communication provider to deliver the service in the right manner and responding to customers' needs. Hence Factor 1 will be addressed as 'Service Delivery (ServDelv)'.

Items A1, A2, A3, A4, T2, T3 are part of Factor 2 with factor loadings ranging from 0.629 to 0.829. Since all these items relate to the assurance given by the employees and other tangible assets which reinforce confidence in the customer, Factor 2 will be called as 'Assurance'.

Items NwCoverage, NwClarity, DataSpeed load onto factor 3 with loadings of 0.864, 0.844, 0.775 respectively. Since all these items corresponds to the technical performance of the mobile communication provider's network, this factor will be called as 'Technical Quality (TechQlty)'. Items E1, E2, E3, E4 are a part of factor 4 with factor loadings ranging from 0.617 to 0.764. These items reflect the empathy shown by the mobile communication provider and hence will be called as 'Empathy'

Items T1 and T4 have factor loadings 0.863 and 0.697 respectively and load onto factor 5. Both these items refelect the customers' perception about the tangible and physical things used or are a part of the service delivery. Hence Factor 5 will be called as 'Tangibles '

Table 5 summarizes the item details and names given to each factor.

Table 5 Items and Factor names

Factor	Item	Item description	Factor Loadings	Factor Name
Factor 1	Re1	Delivers the service as it had been promised	0.673	ServDelv
	Re2	Is dependable in solving customers' problems	0.730	
	Re3	Provides the right service(as you requested) in the first time itself	0.690	
	Re4	Honors timelines in delivering the service	0.695	
	Re5	Maintains error-free records (of usage, billing etc.)	0.636	
	Res2	Gives satisfactory service in critical times	0.641	
	Res3	Is willing to help customers	0.652	
	Res4	Readily responds to customers' specific requirements	0.646	

Factor	Item	Item description	Factor Loadings	Factor Name
Factor 2	A1	Behavior of employees (at call center or stores) instill confidence in customers	0.829	Assurance
	A2	Employees (at call center or stores) make customers feel safe in their transaction	0.781	
	A3	Employees (at call center or stores) are consistently courteous	0.750	
	A4	Employees (at call center or stores) have appropriate knowledge to answer customer	0.727	
	T2	Stores are visually attractive	0.715	
	T3	Employees who have a neat, professional appearance	0.629	
Factor 3	NwCoverage	Has excellent Network coverage	0.864	TechQlty
	NwClarity	has excellent Network/ voice clarity	0.844	
	DataSpeed	Provides high data speeds	0.775	
Factor 4	E1	Gives customers individual attention	0.713	Empathy
	E2	Employees (at call center or stores) have the customer's best interest at heart.	0.764	
	E3	Employees (at call center or stores) take genuine efforts in resolving customer com	0.617	
	E4	Contact center/ store has business hours which are convenient to customers	0.620	
Factor 5	T1	Has Modern and latest technology equipment.	0.863	Tangible

Factor	Item	Item description	Factor Loadings	Factor Name
	T4	Visually appealing materials (SIM Kits, bill envelopes, posters etc) are associated	0.697	

The results of the Exploratory Factor analysis showed 5 distinct factors with Eigen values greater than 1 and explain 69.2% of the cumulative variance. The grouping of the items on the basis of factor loadings revealed that the determinants of Service Quality as perceived by the customers of mobile communication services are Service Delivery, Assurance, Empathy, Tangibles and Technical quality.

Confirmatory Factor Analysis (CFA) is used to check the construct validity. The results obtained through the Factory analysis are further checked by confirmatory factor analysis. CFA is conducted using AMOS 25.

Figure 4.1 shows the factors of the multidimensional construct Service Quality. Measurement model validity is dependent on establishing acceptable levels of goodness-of-fit for the measurement model and finding specific evidence of construct reliability and validity. Validity is defined as the extent to which data collection methods accurately measure what they were intended to measure (Saunders and Thornhill, 2003).

Table 6 Model fit Indices for Confirmatory Factor analysis

Fit Indices	Values
Chi-Square	637.64
Degrees of Freedom	220
P-value	0.00
GFI	0.91
NFI	0.97
CFI	0.98
RMR	0.052
RMSEA	0.072

The above table shows that the standardized Root Mean Square Residual (RMR) and Root Mean Square Error of Approximation (RMSEA) are at 0.052 and 0.072 respectively, which is well below the cut-off value of 0.1 (Malhotra & Dash, 2016). The Goodness of Fit Index (GFI),

Normed Fit Index (NFI) and Comparative Fit Index (CFI) are 0.91, 0.97 and 0.98. These indices should be greater 0.8 for a good model fitment, hence proving the confirmatory factor analysis a good model fit.

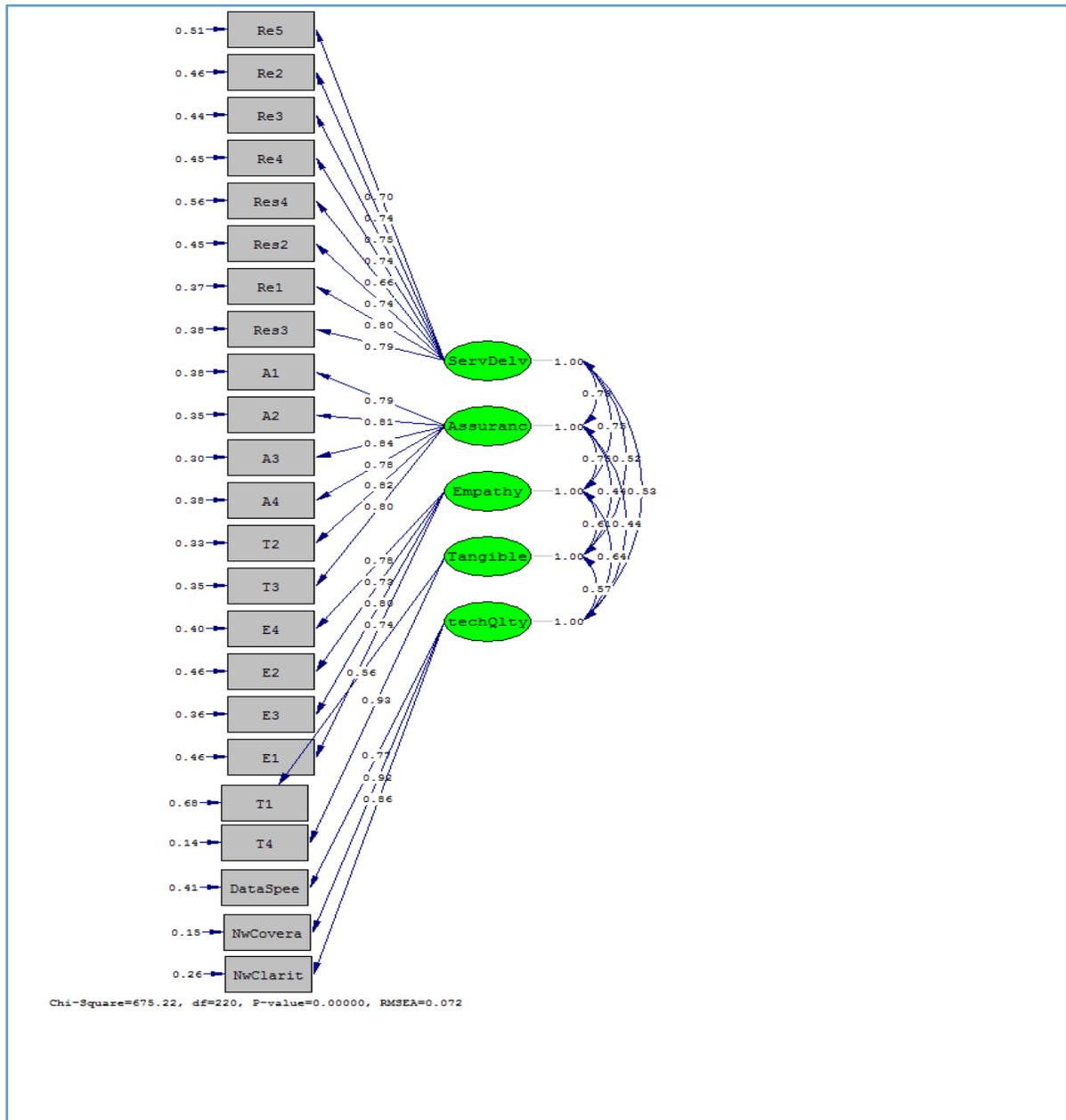


Figure IV: CFA of Service Quality

Regression analysis is a type of predictive modelling technique which examines the relationship between a dependent variable and independent variables or predictors. Regression analysis was used to assess if there is any impact or relationship of service quality on customer satisfaction. Service Quality is a multi-dimensional construct consisting of Service Delivery, Assurance,

Technical Quality, Empathy and Tangibles (as established by the confirmatory factor analysis, above). Impact of each of these variables on customer satisfaction will be assessed.

Table Error! No text of specified style in document. Regression Model Summary: Service Quality and Customer Satisfaction

Model	R	R Square	Std. Error of the Estimate	F	Sig.
1	.826 ^a	.682	.56717106	171.379	.000
a. Predictors: (Constant), Tangibles, Empathy, Technical Quality, Assurance, Service Delivery					

Table 7 shows that the p-value is 0.000 which is less than 0.05. Hence it can be inferred that there is a significant relationship between the service quality and customer satisfaction. It is also observed that R^2 is 0.682, implying that 68.2% of variation in customer satisfaction is explained by the various dimensions of service quality

Table 8 Regression Coefficients: Service Quality and Customer Satisfaction

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.031	.028		5.560	.043
	Service Delivery	.531	.028	.531	18.802	.000
	Assurance	.274	.028	.274	9.722	.000
	Technical Quality	.342	.028	.342	12.135	.000
	Empathy	.268	.028	.268	9.491	.000
	Tangibles	.370	.028	.370	13.097	.000

a. Dependent Variable: Satisfaction

The above table shows that all the independent variables namely Service Delivery, Assurance, Technical Quality, Empathy and Tangibles have positive coefficients and the p-values are less

than 0.05. Thus it can be inferred that all the independent variables have a positive impact on the dependent variable – Customer Satisfaction. The estimated regression model is given below:

$$\text{CSAT} = 0.031 + 0.531(\text{SD}) + 0.274(\text{ASR}) + 0.342(\text{TQ}) + 0.268(\text{EMP}) + 0.370(\text{TANG})$$

Where abbreviations are:

CSAT : Customer Satisfaction

SD: Service Delivery

ASR: Assurance

TQ: Technical quality

EMP: Empathy

TANG: Tangibles

This implied that all the dimensions of service quality had a positive impact on Customer Satisfaction. Amongst the five dimensions, Service delivery had the most impact on Customer Satisfaction and Empathy had the least impact.

V. Findings and Conclusion

In the current competitive scenario of mobile service industry, it is a perplexing task to create, deliver and market the services in accordance with the customer needs. Increasing sophistication of customers, improvement in technology, increased cost of meeting the customers' needs, and decreasing service differentiation are posing a serious challenges to mobile communication providers to attract new customers. Thus it is necessary for the mobile communication providers to delight the customers with ace experience of the service.

Quality is an important aspect of any service delivery and a vital ingredient in delivering a good experience to the customers. Compounded competition, contributes to continuously evolving perceptions of service quality making it necessary for the mobile communication providers to manage service delivery effectively. Improving mobile service experience by identifying and emphasizing more on those critical dimensions of service quality that have strongest influence on customer satisfaction and loyalty is the key to success in the intensely competitive industry.

The results of the Exploratory Factor analysis showed 5 distinct factors with Eigen values greater than 1 and explain 69.2% of the cumulative variance. The grouping of the items on the basis of

factor loadings revealed that the dimensions of Service Quality in the Mobile market of Mumbai were Service Delivery, Assurance, Empathy, Tangibles and Technical quality.

Service Delivery measures the ability of the mobile communication provider to deliver the service in the appropriate manner as expected by the customer and responding to customers' needs.

Assurance measures the confidence instilled in the customer by the employees of the mobile communication provider and some of its tangible assets.

Empathy assesses the caring predisposition of the mobile communication provider and its employees as well as their ability to cater to special requests of the customers.

Tangibles are the customers' evaluation of the mobile communication provider's physical facilities, the appearance of the stores and its personnel and communication materials etc.

Technical Quality measures the technical aspects of the mobile communication provider's service. It consists of Data Speed, Network coverage, and Network Clarity. Data Speed is the speed which customer think he/she gets while using internet on the mobile phone. Network Coverage is the vastness of connectivity that enables the customer to smoothly access the network on highways, inside building, while traveling between cities and states etc. Network Clarity refers to the clear undisturbed voice exchange during a call and minimum call drops ie premature termination of calls.

The confirmatory factor analysis reinforced the results of the exploratory factor analysis. The above-mentioned dimensions of service quality had the goodness-of-fit indices GFI and CFI as 0.91 and 0.97 which are both greater than the cut-off value of 0.9.

Thus it was inferred Service Quality is a multi-dimensional construct with the dimensions being Service Delivery, Assurance, Empathy, Tangibles and Technical quality. In other words, the respondents assess the service quality of the mobile communication providers by assessing the items related to Service Delivery, Assurance, Empathy, Tangibles and Technical quality.

Having established a relationship between service Quality and customer satisfaction, it was important to assess the extent of relationship of each of the service quality dimension with customer satisfaction. The service quality dimensions established in this study were Service

Delivery, Assurance, Empathy, Tangibles and Technical Quality. Linear regression was used to assess this relationship. The regression equation obtained is given below:

$$\text{CSAT} = 0.031 + 0.531(\text{SD}) + 0.274(\text{ASR}) + 0.342(\text{TQ}) + 0.268(\text{EMP}) + 0.370(\text{TANG})$$

This implies that all the dimensions of service quality had a positive impact on Customer Satisfaction. Amongst the five dimensions, Service delivery had the most impact on Customer Satisfaction and Empathy had the least impact.

- References

- Anderson, E., & Mittal, V. (2000). Strengthening the Satisfaction-Profit Chain. *Journal of Service Research*, 3(2), 107-120.
- Bolton, R., & Drew, J. (1991). A Multistage Model of Customers' Assessments of Service Quality and Value. *JOURNAL OF CONSUMER RESEARCH*, 17(4), 375-384.
- CARMAN, J. M. (1990). Consumer perceptions of Service Quality: An assessment of SERVQUAL Dimensions. *Journal of Retailing*, 66, 33-55.
- Cronin, J. J., & Taylor, S. A. (1992, July). Measuring Service Quality: A Reexamination and Extension. *Journal of Marketing*, 56(3), p55-68.
- Devlin, Susan , J. H., Dong , & Brown , M. (1993). Selecting A Scale for Measuring Quality. *Marketing Research*, 5(3), 12-17.
- Dotchin, J., & Oakland, J. (1994). Total quality management in services, part 3: distinguishing perceptions in service quality. *International Journal of Quality & Reliability Management*, 11(4), 6-28.
- Frimpong, S., & Boateng, A. (2014). Quality Service Delivery in the Telecommunication Industry of Ghana. *International Journal of ICT and Management*, 2(2), 163-170.
- Gronroos, C. (1984). A service quality model and its marketing implications. *European Journal of Marketing*, 36-44.
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2016). *Multivariate Data Analysis*. Noida: Pearson India Education Services Pvt. Ltd.
- Kim, M. K., Park, M. C., & Jeong, D. H. (2004). The effects of customer satisfaction and switching barrier on customer loyalty in Korean mobile telecommunication services. *Telecommunications Policy*, 28(2), 145-159.

- Lewis, B. R., & Mitchell, V. M. (1990). Defining and measuring the quality of customer service. *Marketing Intelligence & Planning*, 8(6), 11-17.
- Liu, C.-T., Guo, Y. M., & Lee, C.-H. (2011). The effects of relationship quality and switching barriers on customer loyalty. *International Journal of Information Management*, 31(1), 71-79.
- Lu, Y., Zhang, L., & Wang, B. (2004). A multidimensional and hierarchical model of mobile service quality. *Electronic Commerce Research and Applications; Amsterdam*, 8(5), 228-240.
- Malhotra, N. L., & Dash, S. (2016). *Marketing Research - an applied orientation*. Noida: Pearson India Education Services Pvt Ltd.
- Oodan, A. P., Ward, K. E., & Mullee, A. W. (1997). Quality of Service in Telecommunications. *The IEE Press*, 3-38.
- Parasuraman, A., Zeithmal, V., & Berry, L. (1988). SERVQUAL: a multiple item scale for measuring consumer perception of service quality. *Journal of Retailing*, 12-37.
- Parasuraman, A., Zeithmal, V., & Berry L. (1985). A conceptual model of service model and its implications for future research. *Journal of Marketing*, 41-50. Retrieved from <http://dx.doi.org/10.2307/1251430>
- Santos, J. (2003). E-service quality: a model of virtual service quality dimensions. *Managing Service Quality: An International Journal*, 13(3), 233-246.
- Seth, A., Momaya, K., & Gupta, H. M. (2005). An Exploratory Investigation of Customer Loyalty and Retention in Cellular Mobile Communication. *Journal of Services Research, Special Issue*, 173-185.
- Shah, A., & Schaefer, A. D. (2005). Switching Service Providers: Who Will the Consumer Switch To? *Services Marketing Quarterly*, 27(1), 73-91.
- Su, Q. (2014). Research of instrument to measure customer perceived service quality of mobile data services. *International Journal of Networking & Virtual Organisations*, 14, 176-196.
- Sweeney, J., & Swait, J. (2008). The effects of brand credibility on customer loyalty. *Journal of Retailing and Consumer Services*, 179-193.
- Teas, K. (1993). Expectations, Performance Evaluation, and Consumers' Perceptions of Quality. *Journal of Marketing*, 57, 18-34.

- Telecom Regulatory Authority of India. (2016). *Annual Report 2014 - 2015*. New Delhi: Telecom Regulatory Authority of India. Retrieved from http://traai.gov.in/Content/Annual_Reports.aspx
- The Economist Intelligence Unit. (2017). *Telecoms in 2018*. The Economist Intelligence Unit Limited. Retrieved dec 2017, from http://pages.eiu.com/rs/753-RIQ-438/images/Telecoms_in_2018.pdf?mkt_tok=eyJpIjoiWmpZeFl6WXpNREkyTjJKbCIsInQiOiJsTUx4K1YzNTJLNjFJN0Zud1VrZmhyRGgyUGdGUkJWZmlWV3A3eDZoZUZHOTJrTVdoQnozTDdKaHZJTGIVMjdSOXZiaklQRGhpc3FKXC9tQ212VkJGVDDdqZjg0Y2NUaHZCdnpIOFdsc3VYT1N
- Wang, Y., & Lo, H.-P. (2002). Service quality, customer satisfaction and behavior intentions: Evidence from China's telecommunication industry. *Digital Policy, Regulation and Governance*, 4(6), 50-60.
- Zeithaml, V. A., Berry, L. L., & Parasuraman, A. (1996). The Behavioral Consequences of Service Quality. *Journal of Marketing*, 60(April), 31- 46.
- Zeithaml, V. A., Bitner, M., Gremler, D., & Pandit, A. (2013). *Services Marketing - Integrating Customer Focus across the Firm*. New Delhi: McGraw Hill Education.
- Zeithmal, V., Bitner, M., Gremler, D., & Pandit, A. (n.d.). *Services Marketing*. McGraw Hill Education.