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## A STATISTICAL STUDY ON CUSTOMERS LOYALTY OF MOBILE PHONE SERVICES

**LENIN JOHN**

**ASST. PROFESSOR**

**DEPARTMENT OF MANAGEMENT STUDIES  
VINS CHRISTIAN COLLEGE OF ENGINEERING  
CHUNKANKADAI**

**Dr. D. RANJITHAM**

**PROFESSOR & HEAD**

**DEPARTMENT OF MANAGEMENT STUDIES  
LOYOLA INSTITUTE OF TECH & SCIENCE  
THOVALAI**

### ABSTRACT

*Mobile phone communication is a piece of equipment for the valuable use of people. Though the mobile operators have been rendering services to their customers throughout India, it has become a goal of controversy due to various causes, such as, excess billing, disconnection while talking, cross talk while talking, high cost handset and high operating cost, full talk time and network coverage. Their services are not only praiseworthy, but also satisfying to the consumers to some level. Hence the service providers are facing challenges, not only from the competitors, but also from their customers. The customer's expectations and facts of the mobile phone service are also growing at the other hand. In this research article to assess the customers loyalty towards mobile phone services with appropriate statistical techniques.*

### KEYWORDS

customers, loyalty, mobile phones.

### 1. INTRODUCTION

The telecommunications sector in India was liberalized in the early 1990s. Attack of private as well as foreign direct investment in the sector started afterwards. The mobile telecommunication service providers need to make customer satisfaction a strategic priority. The impact of service quality attributes on customer value, satisfaction, and loyalty. The object of the current research is the mobile telecommunication services in Kanyakumari District, Tamilnadu, India, in which the mobile telecommunication service customers will serve as unit analysis. In this paper mainly focused on customers' loyalty towards service rendered by mobile phone telecommunication.

The literature indicates that quality is a major determinant of satisfaction and has a positive relationship with satisfaction in both the short and long run (Oliver, 1997). Quality judgments should be based on consumer feedback and not on manufacturers' beliefs about product quality (Ozment & Morash, 1994; Gummesson, 1992). Quality is not a single-stimulus factor but a multi-stimulus factor (Devlin, Dong, & Brown, 1993). In addition to quality, non-quality dimensions (e.g., color of a car, shape of a mobile phone) may also play a role in forming consumers' satisfaction.

### 2. OBJECTIVES OF THE STUDY

1. To categorize the service quality dimensions in the mobile telecommunications services sector.
2. To study whether the attributes can correlate relationships among service quality attributes, customer value, customer satisfaction, and customer loyalty.
3. To observe whether customer satisfaction plays mediating role in the relationships between customer value and customer loyalty.
4. To examine whether customer value/customer satisfaction play mediating role in the relationships between service quality attributes and customer loyalty.

### 3. METHODS AND MATERIALS

It was an empirical study done undertaken at Kanyakumari District, Tamilnadu, India, in June 2016-December 2016. This study carried out under unknown population comprised of seven hundred and sixty three people have taken as respondents by using simple random sampling technique of the above mentioned area. A pre-designed questionnaire was used to collect the data. The questionnaire had various segments comprising; socio-demographic factors (gender, age, marital status, etc.). Purpose of using Mobile phone service, Media Exposure, Source of information about service provider, Variables influencing to choose service provider, Consumer expectations, Service Quality of Service Provider, Overall attitude towards service provider and Loyalty towards service provider.

Reliability analysis allows us to study the properties of measurement scales and the items that make them up. The Alpha (Cronbach) model is based on the average inter-item correlation. The results are presented in suitable hypothesis with relevant interpretations. It is found that the hypothesis is rejected (Significant) because  $p$  - value less than 0.05. It is concluded that there exists significant differences between the individual items in the scale. The number of cases are 50, Number of items are 75 and the coefficient of Alpha is 0.80 (i.e. 80%).

### 4. STATISTICAL TOOLS FOR THE STUDY

#### a. Chi-square Analysis

The Chi square test is used in any study on social science and management for testing the independence of two attributes.

#### b. Factor Analysis

Factor analysis is a multivariate statistical technique used to condense and simplify the set of large number of variables to smaller number of variables called factors. This technique is helpful to identify the underlying factors that determine the relationship between the observed variables and provides an empirical classification scheme of clustering of variables into groups called factors.

#### c. Correlation Analysis

The correlation is the study of finding the relationship between the variables. If there are only 2 variables in the study of correlations there it is called simple correlation otherwise the study in either partial or multiple correlation.

### 5. RESULTS OF THE STUDY

#### 5.a Chi-square analysis

From the results of chi-square analysis is presented by the attitude variables considered in the study. The Table 1.1 and Table 1.2 describe overall scores and the results of chi-square analysis in terms of personal variables, chi-square values,  $p$  values and their significance on utility of mobile phone service.

(i) To study the personal factors on utility of mobile phone service

Hypothesis: The personal factors have no significant influence on the opinion of the respondents on utility of mobile phone service related variables.

TABLE 1.1: OVERALL SCORES – PERSONAL VARIABLES ON UTILITY OF MOBILE PHONE SERVICE

Personal variables		Overall Scores – Perception on utility of mobile phone service			
		Low	Medium	High	Total
Gender	Male	76	276	49	401
	Female	65	234	63	362
<b>Total</b>		<b>141</b>	<b>510</b>	<b>112</b>	<b>763</b>
Age	Below 20	30	102	28	160
	20-25	32	124	29	185
	25-30	30	125	23	178
	30-35	20	61	12	93
	35-40	21	72	14	107
	Above 40	8	26	6	40
<b>Total</b>		<b>141</b>	<b>510</b>	<b>112</b>	<b>763</b>
Education	Illiterate	40	143	46	229
	Upto HSC	43	145	32	220
	UG	15	73	12	100
	PG	32	101	16	149
	Professional	11	46	6	63
	Others	0	2	0	2
<b>Total</b>		<b>141</b>	<b>510</b>	<b>112</b>	<b>763</b>
Occupation	Self-Employment	12	38	4	54
	Salaried	41	164	33	238
	Business	47	147	45	239
	Student	31	150	28	209
	Others	10	11	2	23
<b>Total</b>		<b>141</b>	<b>510</b>	<b>112</b>	<b>763</b>
Personal Income	Nil	13	48	12	73
	Below Rs.10,000	34	132	24	190
	Rs.10,001-Rs.15,000	50	234	56	340
	Rs.15,001-Rs.20,000	33	77	18	128
	Above Rs.20,000	11	19	2	32
<b>Total</b>		<b>141</b>	<b>510</b>	<b>112</b>	<b>763</b>
Marital Status	Single	82	337	68	487
	Married	59	173	44	276
<b>Total</b>		<b>141</b>	<b>510</b>	<b>112</b>	<b>763</b>
Size of family	1-2	36	123	25	184
	3-4	62	259	60	381
	5-6	34	102	23	159
	Above 6	9	26	4	39
<b>Total</b>		<b>141</b>	<b>510</b>	<b>112</b>	<b>763</b>
Number of family members (earning)	1	47	197	51	295
	2	39	150	34	223
	3	51	118	21	190
	Above 3	4	45	6	55
<b>Total</b>		<b>141</b>	<b>510</b>	<b>112</b>	<b>763</b>
Monthly family income	Below Rs.10,000	12	49	11	72
	Rs.10,001-Rs.20,000	59	246	58	363
	Rs.20,001-Rs.30,000	54	171	34	259
	Above Rs.30,000	16	44	9	69
<b>Total</b>		<b>141</b>	<b>510</b>	<b>112</b>	<b>763</b>

Source: primary data

TABLE 1.2: CHI SQUARE VALUES – PERSONAL VARIABLES ON UTILITY OF MOBILE PHONE SERVICE

S.No	Personal variables	Chi-square Value	p values	Significant/ Not Significant
1	Gender	4.08	0.130	NS
2	Age	3.32	0.973	NS
3	Education	12.08	0.280	NS
4	Occupation	19.00	0.015	S
5	Personal Income	15.30	0.054	NS
6	Marital status	3.55	0.169	NS
7	Size of family	3.51	0.743	NS
8	Number of family members (earning)	18.22	0.006	S
9	Monthly family income	3.89	0.692	NS

S – Significant at 5% level (p value <= 0.05); NS – Not Significant at 5% level (p value > 0.05)

It is found from the Table 1.2 that the hypothesis is rejected (Significant) in two cases and other cases are accepted (Not significant). It is concluded that the personal factors 'Occupation' and 'Number of family members (earning)' have significant influence on the utility of mobile phone service in the study of customer loyalty towards mobile phone services among people in Kanyakumari District.

**5.b Factor Analysis**

Factor Analysis is primarily used for data reduction or structure detection. The purpose of data reduction is to remove redundant (highly correlated) variables from the data, perhaps replacing the entire data with a smaller number of uncorrelated variables.

The purpose of structure detection is to examine the underlying (or latent) relationships between the variables. The factor analysis procedure has several extraction methods for constructing a solution.

**i. Kaiser-Meyer-Olkin Measure of Sampling Adequacy**

The significance (0.00) is less than the assumed value (0.05) & KMO coefficient = 0.696. This implies that the factor analysis is valid.

**TABLE 1.3: ROTATED FACTOR LOADINGS FOR LEVEL OF UTILITY OF MOBILE PHONE SERVICE**

Variables of utility of mobile phone service	F1	F2	F3	F4	Communality
Security (A1)	-0.26	0.48	0.34	0.22	0.47
SMS (A2)	0.08	-0.09	0.78	0.02	0.62
Official (A3)	-0.07	-0.09	-0.05	0.76	0.60
Touch with friends and Relatives (A4)	0.07	0.14	0.72	-0.06	0.55
Symbol of Status (A5)	0.24	0.30	0.02	0.51	0.40
Convenience (A6)	0.04	0.73	0.00	-0.18	0.56
Low cost (A7)	0.23	0.64	-0.01	0.15	0.48
Passion (A8)	0.65	-0.12	0.06	0.26	0.51
STD Calls (A9)	0.67	0.16	-0.13	-0.08	0.50
Dissatisfaction with land line (A10)	0.59	-0.03	0.17	0.30	0.47
Multipurpose (A11)	0.70	0.08	0.03	-0.15	0.52
Easy to contact (A12)	0.58	0.11	0.09	0.01	0.36
Eigen value	2.41	1.41	1.15	1.07	
% of var. explained	20.05	11.73	9.56	8.87	50.21
Cum. % explained	20.05	31.78	41.34	50.21	

Table 1.3 gives the rotated factor loadings, communalities, Eigen values and the percentage of variance explained by the factors. Out of the 12 variables associated with the utility of mobile phone service, 4 factors have been extracted and these 4 factors put together explain the total variance of these variables to the extent of 50.21%. In order to reduce the number of factors and enhance the interpretability, the factors are rotated. The rotation increases the quality of interpretation of the factors. There are several methods of the initial factor matrix to attain simple structure of the data. The varimax rotation is one such method to obtain better result for interpretation is employed and the results are given in Table 1.4.

**TABLE 1.4: CLUSTERING OF UTILITY OF MOBILE PHONE SERVICE**

Factors	Utility of mobile phone service	Rotated factor loadings
Factor I (20.05%)	A8	0.65
	A9	0.67
	A10	0.59
	A11	0.70
	A12	0.58
Factor II (11.73%)	A1	0.48
	A6	0.73
	A7	0.64
Factor III (9.56%)	A2	0.78
	A4	0.72
Factor IV (8.87%)	A3	0.76
	A5	0.51

Five factors were identified as being maximum percentage variance accounted. The five variables A8, A9, A10, A11 and A12 were grouped together as factor I and accounts 20.05% of the total variance. The three variables A1, A6 and A7 constituted the factor II and accounts 11.73% of the total variance. The two variables A2 and A4 constituted the factor III and accounts 9.56% of the total variance. The two variables A3 and A5 constituted the factor IV and accounts 8.87% of the total variance.

The five variables of utility of mobile phone service such as Passion (A8), STD Calls (A9), Dissatisfaction with land line (A10), Multipurpose (A11) and Easy to contact (A12) were grouped together as factor I and accounts 24.2% of the total variance.

**ii. Correlation Analysis**

The correlation is the study of finding the relationship between the variables. If there are only 2 variables in the study of correlations there it is called simple correlation otherwise the study in either partial or multiple correlation. In this study the simple inter-correlations analysis is performed between the selected variables and the results are presented in the form of correlation matrix. Further the significance of correlation was tested at the 1% level of significance.

In this section the results of inter-correlation analysis between the variables of utility of mobile phone service as factor I are presented through correlation matrix. The results of the inter-correlation analysis with its significance are presented in the form of correlation matrix.

It is found that the entire variables of utility of mobile phone service on the basis of factor I considered have significant inter-correlation.

It is concluded that the variables of utility of mobile phone service such as Passion (A8), STD Calls (A9), Dissatisfaction with land line (A10), Multipurpose (A11) and Easy to contact (A12) have significant interrelationship between them.

**6. CONCLUSION**

The results obtained in this study accept the model and hypotheses proposed therein. The results of the study showed that the personal factors ‘Occupation’ and ‘Number of family members (earning)’ have significant influence on the utility of mobile phone service. Furthermore, the research contributes to the five variables of utility of mobile phone service such as Passion, STD Calls, Dissatisfaction with land line, Multipurpose and Easy to contact were grouped together as factor I and accounts 24.2% of the total variance. This research, however, evaluated the variables influencing customer loyalty of phone services in the context of Kanyakumari District. The findings of the correlation analysis showed that the above variables also have significant interrelationship between them. The service quality had the strongest total effect on customer loyalty. These results suggest that customer loyalty is most significantly affected by the high quality service. Finally, the results of this study can assist researchers and academicians to understand the impact these variables have on the customer’s intention to change service provider and the correlation between these factors.

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