Abstract of the Ph.D. Thesis
Title

A STUDY OF MOBILE SERVICES FROM CUSTOMER'S PERSPECTIVE

By

MRS. ARUNA A. DEOSKAR

FOR

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UNDER THE GUIDANCE OF
DR. (MRS.) SMITA D. TOTADE
PROFESSOR, NATIONAL INSURANCE ACADEMY,
PUNE, 411045

1. Introduction

The booming revolution in Information Technology sector has pushed the India's telecom market significantly. India has shown tremendous growth in past few years in terms of cellular services. Since past few years consumers prefer wireless mode of telephone services to wire line services. As per the survey report conducted by voice & Data by the end of Feb 2008 the mobile subscribers number has reached to 246.6 mn compared to wire line services, which is only 40 mn. in number[1].

Cell phones are a vast improvement over the telecommunications technology of the past, and now become an important asset in today's busy life. Cell phones have become the necessity in today's competitive environment to meet the emerging global economy.

1.1 Basics of Cell phone

Cell phones, also known as mobile phones or wireless phones, are hand-held phones with built-in antennas[2]. They can be carried out anywhere any time. Cell phones are actually two-way radios, much like the walkie-talkies of the past, When some one talk into cell phone receiver, it registers voice and converts the sound waves into radio waves. These waves travel through the air & reaches to a receiver, which is usually found at a base station. This base station will then send your call through a telephone network to the actual destination. & vice versa.

The first public commercial mobile phone network was started in Finland in 1971. In the *first generation* mobile phones. In 1990 the second generation mobile phones were introduced with the introduction of GSM (Global System for Mobile Communications), TDMA(Time Division Multiple Access) & CDMA (Code Division Multiple Access) technologies.

The third generation mobile phone was not standardize on a technology, but based on some requirements like 2 Mbit/s maximum data rate for indoors, & 384 kbit/s outdoors.

India has shown tremendous growth in mobile services in past few years. The survey shows that India has 65,396,109 CDMA subscriber base and 184,678,957 GSM subscribers by February 2008[1 & 3].

2. Need of the Study

The researcher has tried to identify the core customer service parameters & study their impact on customer satisfaction. As per the Servqual model given by Parasuraman, Valerie Zeithaml, and Leonard Berry, there exists gap between the services delivered & services received by the customer. Similarly there is a gap in understanding the customer requirements from the service provider's & customer's perception. Service satisfaction is associated with the service quality & service expectation. But this expectation is closely related & associated with customer perception, which changes from person to person.

To raise the service satisfaction level & to ensure good service quality Telecom Regulatory Authority of India (TRAI) has put up several benchmarks[5&6]. The need is to compare the observed data against these benchmarks in order to understand the service satisfaction level.

Service level satisfaction is a qualitative term & so can be measured in terms of customer satisfaction Index score. A customer satisfaction index is a parameter for measuring the Customer satisfaction. CSI is a way of measuring the service satisfaction. Measurement of customer satisfaction thus needs to take a number of service factors & service parameters into consideration. Indices consist of manifest variables (independent variables) and latent variables (dependent variable). Satisfaction as a latent variable is measured through several manifest variables. The manifest variables considered in this study for mobile satisfaction are : **Network connectivity, Customer Care, Billing services, call drop and Value Added Services**.

3. Literature Survey

Despite of several service quality standards to improve the service quality & raise the customer satisfaction level, customer is not getting the desired service. There exist the gap between service delivered & service received. The prime need is to understand the basic customer requirements. Customers often do not know, or cannot communicate effectively, their actual needs and requirements. This is one of the major challenges which Service Industries facing today. This needs the more creative methods for understanding customer requirements effectively. **Voice of the customer** (VOC) is such a technique to find the customer's need effectively. VOC is a term used in business to

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describe the process of capturing a customer's requirements. The Voice of the Customer is a market research technique that produces a detailed set of customer wants and needs[7]

In meeting customer's requirements and measuring customer satisfaction indexes, customer perception should be a key consideration.

As per the report released by TRAI Telecom Regularity Authority of India, **'Quality of Service'** is the main indicator of the performance of mobile services. TRAI has recommended in its report that a subscriber's perception of the Quality of Service (QoS) should also be considered while determining the overall quality of service provided by a broadband service provider. Since the customer perception with respect to different mobile services may differ from person to person & so needs to be measured through survey corresponding to different service quality parameters. The key parameters upon which customer satisfaction is measured through this survey are:

1) Billing performance
2) Help services – Customer Care
3) Network Connectivity & Coverage, Call drop
4) Customer satisfaction with offered supplementary services (Value Added Services)
5) Overall customer satisfaction

Benchmarking is a continuous, systematic process for evaluating the products, services and work processes for the purpose of improvement. TRAI has set up certain benchmarks against these parameters[6]:

1. Percentage satisfied with the billing performance >90%

2. Percentage satisfied with the help services >90%

3. Percentage satisfied with the network performance>95%

4 Percentage satisfied with the offered supplementary services (VAS)>95%

5 Percentage satisfied with the Overall quality of service >95%

In this study, the researcher has found that there is a huge gap between the set benchmarks for different parameters & actually what customer receives.

4. Objectives/Hypothesis of the study

Outcome of the Research will be beneficial to mobile service providers as well as government organization to understand service quality parameters from customer perception & expectation point of view. This may help to update the set benchmarks & so can improve the satisfaction level. The hypothesis of study observes the impact of service parameters like network coverage, billing services, customer care, call drop, & Value Added Services on customer satisfaction.

Objective of the study

- Main Objective

  - **To find the impact of customer service parameters on customer satisfaction.**

  - **To Develope a Customer Service Metric based Customer Satisfaction Index**.

- Sub Objectives

  - **To find out the association of network coverage on customer satisfaction**

  - **To find out the association of Billing services on customer satisfaction**

  - **To find out the association of customer care on customer satisfaction**

  - **To find out the association of call drop on customer satisfaction**

  - **To find out the association of value added services on customer satisfaction**

  - **To get the Customer Satisfaction Index for mobile services**

Main hypothesis of study

H : There is a positive association between the Quality-of-Service parameters and customer satisfaction .

Sub hypothesis are :

H1 : There is a positive association of Network Coverage with Customer Satisfaction .

H2 : There is a positive association of Billing Services of mobile with the customer satisfaction .

H3 : There is a positive association of Customer Care of mobile services with customer satisfaction .

H4 : There is a negative association of call drop with customer satisfaction.

H5 : Value Added services has a neutral association with customer satisfaction.

The researcher has got satisfaction ratings after analyzing the customer voice & they are compared with the set benchmark as given by the TRAI. A customer satisfaction metrics has also been designed after understanding & incorporating the Customer responses. This will help the service provider to understand the real pain areas i.e. the major areas where they have to improve in order to raise the overall Customer Satisfaction Index.

5. Methodology & Source of Data

This research study is done through a survey. Survey is referred as the best research method to understand public opinion regarding any issue. So this method can help to produce the precise result.

- o To achieve the above-mentioned objectives & to prove these hypotheses, the study is done through Survey method.
- o Questionnaires are filled by personally interviewing various customers ranging from students to corporate employees, housewives to business people.
- o Interview technique is used to get the valid & reliable data.
- o The questionnaire has used the likert scale questions, & bivariate questions.

Survey has helped the researcher to come up with critical factors, which important to customer, since user perception differs from person to person and perceptions are relative to expectation. Further user expectations are dynamic & changes over time with respect to age, occupation, gender. The need is to understand the user perception with reference to their expectation point of view. So researcher has done a survey through questionnaire by taking a sample of 575 customers.

Factor analysis is done to get the critical factors, which are affecting the customer satisfaction. The outcome of factor analysis gave five major factors from customer perception and expectation point of view, which are : Network coverage, Billing service, Customer Care, Call Drop & Value Added Service.

Multiple regression analysis is the best way for assessing the quality of predictions of dependent variable with reference to independent variables. It gives the proportion of variance of dependent variable against independent variables. Multiple regression analysis is done with customer satisfaction as dependent variable and major factors i.e: Network coverage, Billing service, Customer Care, Call Drop & Value Added Service as independent variables to understand the correlation between satisfaction & factors. Chi square test method is used to test the hypothesis, as the sample size was large.

Source of Data

In order to have an accurate data, this study has gathered data though Primary & secondary sources of data.

Primary Source : Data was gathered by researcher using questionnaire and by interviewing variety of customer directly. This direct input in form of customer voice has brought in the conceptual clarity.

Secondary Source : Secondary source of data used by researcher includes : published articles, research papers, published books, different research work done previously , relevant papers or journals, magazine etc. Researcher had discussions on various discussion forums, and also used other different types of reports from Internet sites and blogs etc. Benchmark values are collected from several circulars issued by TRAI.

Microsoft Excel & SPSS is used as statistical software tools for data analysis. Process Flow contains :

- o Data is gathered, coded. Positive & Negative questions are identified & accordingly Weightage is assigned to every response as given by respondent.
- o Normality test is done.
- o Factor analysis is done on different questions to get the major factors. Which gives Network coverage, Billing, After Sales Service, Value Added Services & call drop as five major factors affecting service quality.
- o Using multiple regression base model the Index is calculated.
- o Chi square test is used for hypothesis testing.

6. Sampling

A sample is a set or a group of population under study. Sampling is the process of selecting such set or group from bigger population, with which study can be performed. The sample size was calculated after performing a pilot survey. **A Pilot survey was conducted on 200 customers to get the value of standard deviation σ. With 95% accuracy level the required sample size was 560. Total 575 samples were gathered. Out of which 568 valid samples were taken for data analysis. Random sampling technique is used for survey.**

7. Major Findings, Conclusions & Suggestions:

The collected data through the survey are coded and stored using the SPSS software package. Due to large sample size a statistical test namely Chi-square has been done to come up with some findings & conclusions. Some of major findings are as follows:

7.1 The result of testing the first objective :

Factor Analysis is done to get the major parameters & Chi square test is done to test the hypothesis. It reveals that the network coverage, billing services, customer care, call drop & Value Added services emerges as the major service parameters. Further these parameters have strong association with the customer satisfaction. Chi square test was done on individual parameter ratings & overall satisfaction.

7.1.1 Association of Network Coverage with Customer Satisfaction

<p style="text-align:center">Table : overall service of SP * rating to connectivity Crosstabulation</p>

Overall service of SP	Rating to connectivity					Total
	H. Satisfied	Satisfied	Neutral	Dissatisfied	H. Dissatisfied	
Very good	24	66	6	2	1	99
Good	10	239	57	12	1	319
Average	1	45	68	21	2	137
Poor		3	4	5	1	13
Total	35	353	135	40	5	568

Chi-Square Test

	Value	df	Asymp. Sig.
Pearson Chi-Square	200.575	12	.000
Likelihood Ratio	170.704	12	.000
Linear-by-Linear Association	124.885	1	.000
N of Valid Cases	568		

Table shows the probability value is less than 0.05 and so **null hypothesis can be rejected & alternate hypothesis is accepted.**

This results to :

- **Positive association of Network coverage with customer satisfaction.**

7.1.2 Association of Billing services with Customer Satisfaction

Table : Overall service of SP * billing service Cross tabulation

overall service of SP	Billing service					Total
	H. Satisfied	Satisfied	Neutral	Dissatisfied	H. Dissatisfied	
Very good	16	48	23	11	1	99
Good	9	166	88	52	4	319
Average	3	53	44	35	2	137
Poor		4	3	6		13
Total	28	271	158	104	7	568

Chi-Square Tests

	Value	df	Asymp. Sig.
Pearson Chi-Square	50.282	12	.000
Likelihood Ratio	41.240	12	.000
Linear-by-Linear Association	25.617	1	.000
N of Valid Cases	568		

Here the calculated value of Chi square is greater than the table value for 12 degree of freedom and so **null hypothesis is rejected & alternate hypothesis is accepted**.

This results to :

- **Positive association of   Billing services with customer satisfaction.**

7.1.3 Association of After Sales Services (Customer Care) with Customer Satisfaction

<u>Table : overall service of SP * after sales service Cross tabulation</u>

overall service of SP	After sales service					Total
	H. Satisfied	Satisfied	Neutral	Dissatisfied	H. Dissatisfied	
very good	14	52	22	10	1	99
Good	5	156	113	41	4	319
Average	1	34	74	27	1	137
Poor	1	2	5	5		13
Total	21	244	214	83	6	568

<u>**Chi-Square Tests**</u>

	Value	df	Asymp. Sig.
Pearson Chi-Square	80.835	12	.000
Likelihood Ratio	71.960	12	.000
Linear-by-Linear Association	38.907	1	.000
N of Valid Cases	568		

Here the calculated value of Chi Square is greater than the table value for 12 degree of freedom and so **null hypothesis is rejected & alternate hypothesis is accepted**. **This results to :**

- **Positive associations of Customer care with customer satisfaction.**

7.1.4 Association of Call Drop with Customer Satisfaction

<u>Table :   Any call drop * overall service of SP Crosstabulation</u>

Any call drop	Overall service of SP					Total
	Very good	good	Average	Poor	V. Poor	
Yes	26	123	62	12	0	223
No	73	196	75	1	0	345
Total	99	319	137	13	0	568

<div align="center"><u>**Chi-Square Tests**</u></div>

	Value	df	Asymp. Sig.
Pearson Chi-Square	24.485	3	.000
Likelihood Ratio	25.889	3	.000
Linear-by-Linear Association	18.131	1	.000
N of Valid Cases	568		

Here the calculated value of Chi square is greater than the table value for 3 degree of freedom and so **null hypothesis is rejected & alternate hypothesis is accepted**.

This results to :

- **Negative association of call drop with customer satisfaction.**

7.1.5 Association of Value Added Services with Customer Satisfaction

<u>Table   :   Satisfaction with VAS * overall serviceof SP Crosstabulation</u>

	overall serviceof SP				Total
Satisfaction with VAS	Very good	Good	Average	Poor	
Very good	99	3	2	0	104
Good	0	316	0	1	317
Average	0	0	135	1	136
Poor	0	0	0	11	11
Total	99	319	137	13	568

<div align="center"><u>**Chi-Square Tests**</u></div>

	Value	Df	Asymp. Sig.
Pearson Chi-Square	1570.556	9	.000
Likelihood Ratio	1129.693	9	.000
Linear-by-Linear Association	535.396	1	.000
N of Valid Cases	568		

Here the calculated value of Chi square is greater than the table value for 9 degree of freedom and so **null hypothesis is rejected & alternate hypothesis is accepted**.

This results to :

- **Positive association of Value Added service with customer satisfaction.**

Since there exists the positive association of four major parameters on overall satisfaction & so we can conclude by saying that there exists a positive association between service quality parameters & customer satisfaction. **Hence hypothesis H is proved.**

7.1.6 Suggestions :

- o The finding reveals that the network coverage has positive association with customer satisfaction. With better quality of network coverage the overall customer satisfaction rating also increases.
- o Customer Care is an important area and produces direct impact on customer satisfaction. Service provider should take efforts for better customer care.
- o Billing tariff should be planed uniformly & should be reduced.
- o By improving the number of base stations the network coverage & connectivity can be improved which may lead to lower rate of call drops.
- o Customers are also very happy with the availability of Value Added Services along with good network coverage.

## 7.2 The result of testing the second objective :

In order to test the second objective researcher has used simple average weight-age technique to calculate the overall satisfaction score. The major findings are:

- **Customer satisfaction with network services is 77%, which is far below than the desired benchmark as set by TRAI.**
- **Customer has rated the satisfaction with Network Connectivity as 73%.**
- **Regarding Billing charges & Billing services customer is not happy.**
- **Customer is unhappy about After Sales services.**
- **VAS has been rated as one of the highest service satisfaction rating but it depends upon network connectivity.**
- **Customer faces higher call drop within region compared to outside region.**
- **The overall satisfaction Index comes far below than the desired satisfaction level as set by the TRAI.**

Table : Quality Metrics showing satisfaction ratings (on 10 point)

	Area	Rating
1	Service Satisfaction	7.77
2	VAS	7.81
3	Network service	7.45
4	Network connectivity	7.31
5	Billing charges	6.58
6	Billing services	6.74
7	After sales services	6.67
8	Activation Time	7.93
9	Suffered with call drop problem	3.21
10	Call drop frequency	8.35
11	Call drop within region	7.32
12	Call drop outside region	6.78
	Overall Satisfaction Index	**77.03%**

Customer satisfaction rating to basic services provided by service provider (on 10 point)

Customer Ratings

Area	Rating
Call drop outside region	6.78
Call drop within region	7.32
Call drop frequency	8.35
Suffered with call drop problem	3.21
Activation Time	7.93
After sales services	6.67
Billing services	6.74
Billing charges	6.58
Network connectivity	7.31
Network service	7.45
VAS	7.81
Overall service	7.77
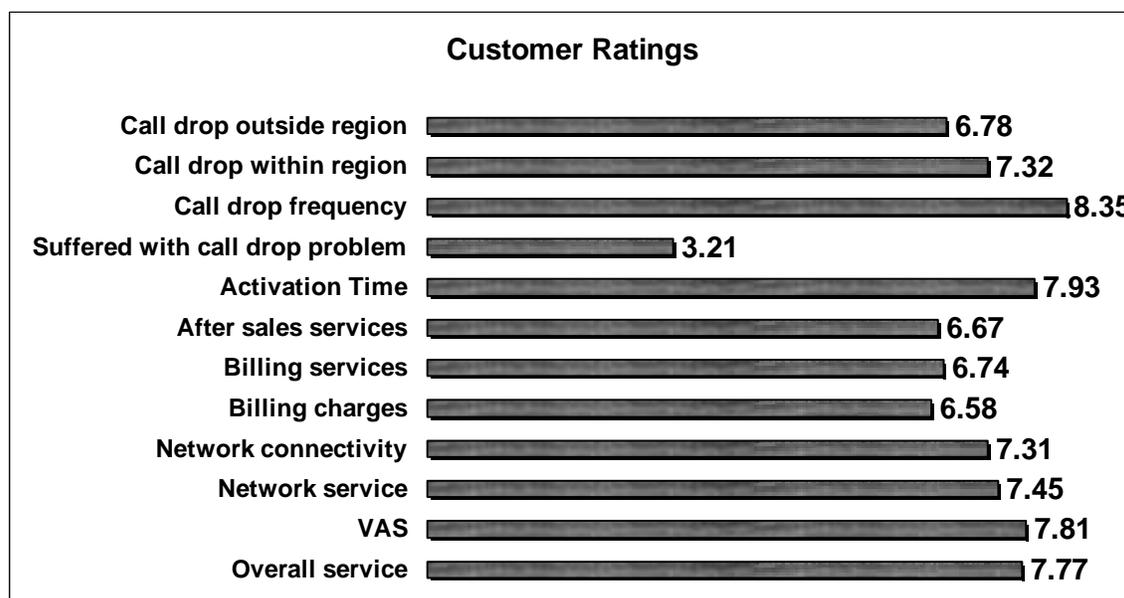
Using regression base model the customer satisfaction Index has been derived. The R-square value indicates that about 94% of the variance in overall satisfaction is explained by these independent variables. **This gives the Customer Satisfaction Index as 77.03%.**

Regression Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.973	.947	.946	.1632

Method : Enter Method

Dependent Variable : Overall satisfaction

Predictors: (Constant), call drop outside region, activation time, Satisfaction with VAS, call-charges, frequency of call drop, after sales service, rating to connectivity, call drop within region, billing service, rating to network service.

The overall satisfaction score of mobile phone services in & around Pune & Pimpri Chinchwad geographical area is calculated through average weighting technique. It was observed that the calculated score is below the benchmark set by the TRAI.

8. Scope of the Study

The scope of this research is scattered among the Pune & Pimpri chinchwad geographical limit. The research confines the study of mobile services from customer's Perspective among subscribers covering 6 mobile service providers. The service parameters covered under study are : Network Coverage, Billing Services, Customer Care, Call drop & Value Added Services.

9. Chapter Scheme (with briefing of each chapter)

Chapter one : **Introduction**

Chapter two : **Literature Review**

Chapter three : **Research Methodology**

Chapter four : **Data Analysis**

Chapter five : **Findings, Conclusions, Suggestions, & Future Direction**

Bibliography

Chapter 1 : INTRODUCTION:

The rapid growth of technology has brought many changes in technique as well as in products. With change in technology the customer perspective about the quality has also changed. The increasing number of wireless subscriber in Indian telecom Industry has raised many challenges towards mobile phone service providers. Although service providers have pulled their efforts to face this competition in order to meet the customer satisfaction challenges & to meet the Benchmarks as set by Standard Authorities of India like Telecom Regulatory Authority of India. But the quality of service of these service providers is not satisfactory from customer point of view.

This chapter covers the basic introductory concepts of service quality, parameters and the set benchmarks. Researcher has aimed to incorporate the voice of mobile users in order to improve the overall service quality from mobile user satisfaction point of view.

Chapter 2 : LITRETURE REVIEW:

Quality is closely associated with customer satisfaction. Customer satisfaction is affected by the number of errors in services assured by the service provider. Service excellence has now become a key factor for any service Industry. As per A. Pershuraman, V.A Zeithaml & C. L. Berry's service quality model highlights the customer focus[12]. SERVQUAL takes into account the perceptions of customers of the relative importance of service attributes. Today the concept of quality has been changed due to the customer awareness. To satisfy such customers, service providers have to understand the customer need by incorporating the voice of customer.

The Press Release of Telecom Regulatory Authority of India was considered as the main source of literature. Bench-Marks are obtained from TRAI against quality parameters under study. The information & updated news releases available on Cellular Operators Association of India was studied to obtain the status of service providers in India.

Chapter 3 : RESEARCH METHODOLOGY

Data has been gathered through the sources of primary & secondary data collection strategies. A survey method is used in this study, while measuring the customer

satisfaction. Questionnaire is prepared covering the five major service parameters considered by researcher in her research study.

Quality of a system depends upon several parameters. This study focuses on five basic service parameters : Network connectivity, call drops, Value Added Services, Billing information & customer care. Questionnaire has been prepared covering all these parameters. Survey has been done with these questionnaires from various customers of different service providers in and around Pune & Pimpri-Chinchwad area.

Likert scale is used as the measurement scale on five point ratings. For this customer survey has done on: Highly satisfied, Satisfied, Neutral, Dissatisfied, Highly dissatisfied. Positive & negative questions are categorized so that proper weights can be assigned. Using multiple regression base model the association of dependent variable with independent variables is found. Customer Service Metrics is designed after incorporating the respondent's ratings. Finally the Overall Satisfaction Index is calculated.

Chapter 4 : DATA ANALYSIS:

Introduction :

Data has been collected through several customers belonging to Pune & Pimpri-Chinchwad area. The data was gathered from different service providers covering Idea, AirTel, BSNL, Reliance, Hutch-Voda & Tata. The collected data has been processed & analyzed according to the outline defined in Research Methodology chapter. Hypothesis testing is done through the Chi Square testing. SPSS Package is used to perform Chi Square test & to get the cross tabulation.

The collected data has been edited & then coded to get the required result. Normality test is done through SPSS to check the data accuracy. Satisfaction with the overall quality of the service is obtained through customer survey. Based on the five-point-scale the researcher has obtained the Percent of completely satisfied, partially satisfied, neutral, dissatisfied, and non-satisfied customers

Outcome of this study includes design of the quality metrics and calculation of the overall satisfaction index.

Chapter 5 : FINDINGS, CONCLUSION, SUGGESTIONS, AND FUTURE DIRECTIONS:

This chapter provides a summary of the findings. Further relevant suggestions are conveyed in form of solution, which will be useful to government organization to set up the new service benchmark. This chapter explores in brief the result of the research study.

Limitations :

- o This research is limited to mobile service industry but could be beneficial to other service sector to understand the customer perception wherever required.
- o The survey is limited with five basic parameters.
- o Geographical location is limited to Pune & Pimpri chinchwad area.

Conclusion :

To meet the customer perception & customer expectation this research findings will provide some base to raise the customer satisfaction level by understanding the impact of basic service parameters. Service providers have to put-up extra efforts to raise the satisfaction level of users.

SUBMITTED BY   :

Mrs. Aruna A. Deoskar
RESEARCH STUDENT

UNDER THE GUIDANCE OF :

Dr. (Mrs.) Smita D. Totade
RESEARCH GUIDE

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