Service Delivery & Customer Satisfaction in Mobile Communication Sector in India

(With Special Reference to West Central India)

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Supervisor

Prof. (Dr.) P.K. Sharma

Director, School of Commerce and Management

By

Vishwas Pandey

DEPARTMENT OF MANAGEMENT

VARDHMAN MAHAVEER OPEN UNIVERSITY

KOTA-324021 INDIA

DECLARATION

This is to certify that the thesis entitled **"*Service Delivery & Customer Satisfaction in Mobile Communication Sector in India (With Special Reference to West Central India*)**" submitted by me for the award of degree *of* ***Doctor of Philosophy (Ph.D.)*** in Management is a bon-a-fide work of undersigned, carried out under the supervision of Prof. (Dr.) P. K. Sharma, Director, School of Commerce and Management, Vardhman Mahaveer Open University Kota.

The content of this thesis, in full or parts have not been submitted to any other Institute or University for the award of degree or diploma.

Signature

Place: Kota

Date:

(Vishwas Pandey)
Research Scholar
Vardhman Mahaveer Open University
Kota

CERTIFICATE

This is to certify that the thesis entitled "***Service Delivery & Customer Satisfaction in Mobile Communication Sector in India (With Special Reference to West Central India)***" submitted for the award of Ph.D. degree in Management is a bon-a-fide work of ***Mr. Vishwas Pandey***, carried out under my supervision and guidance.

He has fulfilled the requirements for the degree of Doctor of Philosophy in Management at **Vardhman Mahaveer Open University, Kota** regarding the nature and prescribed period of work.

The thesis submitted by him incorporates the work done by him and has not been submitted elsewhere for any degree or diploma.

Prof. (Dr.) P.K. Sharma

Research Supervisor &

Director, School of Commerce and Management,

Vardhman Mahaveer Open University, Kota.

Place: Kota

Date:

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Executive Summary

The telecommunications industry has changed radically in the past 10 years as data-hungry customers with smart devices consume ever more bandwidth. Over this period, operators have expanded their service portfolios and overhauled their price plans to meet explosive demand, while rising capital expenditures underline the ongoing imperatives to upgrade network capabilities. Operator performance varies significantly by region. While many players are diversifying their revenue streams, ensuring that new services deliver healthy margins remains challenging. At the same time, over-the-top (OTT) players are also expanding the scope of their offerings, disrupting different industry verticals in the process. All entities in the digital ecosystem are now seeking new points of differentiation in order to maximize their share of customer spend. As a result, issues of competition and collaboration have never been more pronounced. Customer experience management dominates the Telco strategic agenda — 68% of senior industry executives cite it as their number one strategic priority. As operators look to boost loyalty and spend, higher levels of customer service allied to greater service personalization are seen as critical levers.

The Indian Telecom Industry is one of the fasted growing sectors worldwide. This sector of any country can tremendously affect the society with different products and services which is also true for India. In India, mobile phone operators are contributing a lot with their services by the creation of value to the society. This sector is dominated by a few operators in each circle (State). Ever-increasing use of internet in each part of human life has made this service luxury to most essential. The voice service is being dominated by data services. Users are concerned more about internet data speed rather than clarity of voice. Customers are increasingly focused on data. Media and video were less than 10% of traffic in 2010; now it is almost 63% in 2017." Here the question comes of quality. Quality is generally regarded as being a key factor in the creation of worth and in influencing customer satisfaction. Hence, the telecommunication industry in India has to be strategically

positioned to provide quality services to satisfy customers. To provide improved quality service, telecommunication companies need to investigate degree of customers' sensitivity and expectations toward service quality. Armed with such information, telecommunication outfits are then able to strategically focus service quality objectives and procedures to fit the Indian market. This study investigated the relationship of customer satisfaction with quality of service, perceived value, customer care services and customer loyalty in mobile telecommunication service market of India. The research also investigated customer satisfaction levels in West central Indian region and its comparison. Study also searched for best operator in Rajasthan, Madhya Pradesh and Gujarat.

Measuring customer's satisfaction provides an indication of how successful the organization is in providing services to the market. The customers are very crucial and play a vital role in any process of industry especially in service sector. Today, customers are the kings of the marketplace as present scenario is customer dominated. Supply is more and demand is less. Customers have lot of options to choose from. A large majority of telecom service providers is losing their current customers at a considerable rate. That is where the concept of customer satisfaction and consumer retention comes because the customers make the marketers to rethink about designing the products and services and delivery of the same up to the committed level. They have to think about their offerings related to quality of services, customer care services, consumer's choices, value for money etc. also. Many service providers are smart enough to understand consumers' needs, wants and demands and deliver beyond their expectations i.e. they succeeded to feel them delighted & keep connected. It enables them growing, profitable and creative with ample inventions.

Drawing upon quantitative techniques, this study aimed to offer fruitful insight into this relationship within India's telecommunication market, focusing on customer satisfaction which is driven by delivery of committed services, Perceived Value, Customer Care services and customer loyalty. This topic was found highly justified in the present matured and competitive market where profits are declining day by day, mergers are taking place, price war is at its peak, nationwide emerge of

4G technology by Reliance Jio, numerous tariff choices, incentives on porting out etc.

This research was undertaken as a case study in the West-Central Indian telecommunication market. Four major telecommunications operators Bharat Sanchar Nigam Limited (BSNL), Airtel, Idea and Vodafone were selected for study. A self explanatory close ended questionnaire was prepared as data collection tool. The samples were collected from Rajasthan, Madhya Pradesh and Gujarat states which are part of west central India. To determine the variations and relationship between the main operators in the market regarding their adopted levels of delivery of services various Quantitative data analysis tools and tests were used which included Spearman's rank correlation and F-Test , ANOVA (Analysis of Variance) and Post-Hoc Test etc.

The main issues evaluated of four major telecom operators were:

(1) Relationship of customer satisfaction with quality of service, perceived value, customer care services and customer loyalty.

(2) Comparison of level of satisfaction among their customers based on above four factors.

These tests were conducted within the group (Intra State: Among Telecom Operators) and among the groups (Inter State: Among three States) using F Statistics (ANOVA) and Post-Hoc Test. This research tried to establish relationship among customer satisfaction with service quality, tariffs, and customer care services. This research also tried to find customer loyalty and overall satisfaction based upon four constructs of customers of four major telecom operators in West central Indian region.

In contrast, this study is concerned with gaining in-depth understanding of customer satisfaction through evaluating detailed questionnaire which will be helpful for telecom policy makers and other professionals of the industry.

This study will also be helpful for Telecom players and Govt. agencies to analyze reasons of customer's dissatisfaction, parameters important for quality of service and ultimately how to retain the existing customers and gain the market share.

List of Research Publications and Paper Presentations

Paper Presented:

1. Attended National conference at Pacific Institute of Hotel management Udaipur and presented a paper on **"Determinants of pleasant tourism experience in India"** on 7th and 8th August,15 hosted by pacific University.

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2. Attended a regional workshop on: ***"Enhancing Personal Effectiveness-The Indian Way"*** on 12th Sept, 2016 hosted by Indian Society for Training and development.

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List of Abbreviations

Abbreviation	Meaning
2G	Second Generation
3G	Third Generation
4G	Fourth Generation
ADC	Access deficit charges
ADSL	Asynchronous Digital subscriber loop
ANOVA	Analysis of Variance
ANOVA	Analysis of Variance
ARPU	Average Revenue per Unit
B2B	Business-to- Business
BBNL	Bharat Broadband Network Limited
BCG	Boston Consulting Group
BPL	Below Poverty Line
BSE	Bombay Stock Exchange
BSNL	Bharat Sanchar Nigam Limited
BTRC	Bangladesh Telecommunication Authority Commission
BWA	Broadband wireless Access
CAGR	Compound Annual Growth Rate
CAPEX	Capital Expenditure
CCS	Customer Care Services
CDMA	Code Division Multiple Access
C-DOT	Centre for Development of Telematics
CL	Customer Loyalty
CMSP	Cellular Mobile Service Providers
CMTS	Cellular Mobile Telephone Service
COE	Centres of Excellence
CPS	Concert Packet Service
CPSU	Central Public Sector Units
CR	Customer Retention
CRM	Customer Relationship Management
DoT	Department of Telecommunications
DSL	Digital Subscriber Line
DTH	Direct to Home
DTO	Departments of Telecom Operations
DTS	Departments of Telecom Services
ECB	External Commercial Borrowing

EDGE	Enhanced Data for Global Evaluation
EPABX	Electronic Private Automatic Branch Exchange
FDI	Foreign Direct Investment
FIPB	Foreign Investment Promotion Board
FMEA	Failure Modes and Effects Analysis
FTTH	Faber to the Home
Gbps	Giga Bits per Seconds
GDP	Gross Domestic Production
GEDIS	Gateway Electronic Data Interchange Service
GEMS	Gateway E-Mail and Store
GMPC	Global Mobile Personal Communication
GPON	Giga Ethernet Optical Network
GPRS	General Packet Radio Switching
GPS	Global Positioning System
GPs	Gram Panchayats
GPSS	Gateway Packet Switched Data Services
GSM	Global System for Mobile Telecommunications
GSMA	GSM Association
GTL	Global Telecom Limited
HTL	Hindustan Tele-printers Ltd.
I.O.T	Internet of Things
ICTE	Information and Communications Technology and Electronics
IDC	Internet Data Services
ILD	International Long Distance
ILL	Internet Leased line
IN	Intelligent Network
INMARSAT	It is a British satellite telecommunications company, offering global mobile services
IPTV	Internet Protocol Television
ISDN	Integrated Services Digital Network
ISPs	Internet Service Provider
ITA	International Telecommunication Association
ITU	International Telecommunication Union
IVRS	Interactive Voice Response
KPI	Key Priorities Area
LTE	Long Term Evaluation
LTV	Lifetime Value
Mbps	Mega bits per Seconds

MGS	Multiplier Grants Scheme
MNP	Mobile Number Portability
MP	Madhya Pradesh
MPEG	Moving Picture Experts Group
MPLS	Multiprotocol Label Switching
MTNL	Mahanagar Telephones Nigam Limited
NLD	National Local Dialling
NOFN	National Optical Faber Network
NSE	National Stock Exchange
NTELSAT	International Telecommunication Satellite Organization
NTP	New Telecom Policy
OA_{SAT}	Overall satisfaction
OSS	Open Source System
PCM	Pulse Code Modulation
PDCA	Plan-Do-Check-Act
PGCIL	Power Grid Corporation India Limited
PIMS	Profit Impact of Marketing Strategy
PNQ	Perceived Network Quality
POP	Point of Presence
PSU	Public Sector Unit
PV	Perceived Value
QFD	Quality Function Deployment
R&D	Research and Development
R.Com	Reliance Communications
RM	Relationship Marketing
ROI	Return on Investment
SAS	System of Accounting Separation
SERVPEF	Service Performance
SERVQUAL	Service Quality
SIP-EIT	Support International Patent Protection in Electronics & IT
SPSS	Statistical Package for Social Sciences
SRLC	Customer Satisfaction-Retention-Loyalty Chain
STD	Subscriber Trunk Dialling
TEC	Telecom Engineering Centre
TERI	The Energy and Resources Institute
TQM	Total Quality Management
TRAI	Telecom Regulatory Authority of India
UASL	Unified Access License
UASL	Unified Access Service Licensees

USD	United State Dollar
USO	Universal Service Obligation
VAS	Value Added Services
VDSL	Very-High-Bit-Rate Digital Subscriber Line
VoIP	Voice Over Internet Protocol
VPN	Virtual Public Network
V-SAT	Very Small Aperture Terminal
Wi-Fi	Wireless Fidelity
WLL	Wireless in Local Loop
WOM	Word of Mouth

Chapter -I

General Introduction

1.1 Context of the Research

World's second largest population of 1.3 billion resides in India. It's a young nation with 63% of its population below the age of 35 years. It has speedy growing mobile/data users with 1.19 billion mobile connections and over 400 million internet users as on 31.03.17. Today's world is being governed by; bringing countries together, economic liberalization and privatization. Such revolutionary initiatives offers way for total reforms, in particular in developing economies, like ours. These developing countries felt the importance of communications and information technology to travel onto the path of progress. During post-liberalization, the growth of the telecom sector in India has been unexpected. This study aims to throw light on the factors that are responsible for customer satisfaction and quality of service for sustaining growth in the segment and presents an insight on the present status of the industry.

The word "telecommunication" is a mixture of the Greek word prefix "tele" meaning 'far off', and the Latin word "communicare", meaning 'to share'. In its current usage, it refers to put on air of signals over a distance for the function of communication. Previously, communication took place by means of drums, smoke signals, and ribbons type conventional mediums. From such old early stages, the means of communication

now engage complicated high-speed, optical fiber cables laid through ocean beds and non-natural satellites in space. Due to growing domestic and commercial requirement for signal broadcast, the pace of transmission has also augmented. Mobile services are now known as a key to the fast development and modernization of the economy and an important mechanism for socio-economic progress for a country. The telegraph network is the first where latest system of transmission in India deployed. Various telecom statutes were enacted by the Government of India in order to make sure telegraph network's individuality and establishment of administration control over electronic infrastructure, which laid the base of the present regulatory support governing telecommunications. Previously for a long period, our country has shown rising number of land line connections. Earlier when GSM (Global System for Mobile Telecom) technology was introduced in the form of cellular phones, it was not instantly accepted by the Indian subscribers, mainly due to high price of mobile phones as well as high calling charges. Slowly and steadily, the price of mobile handset as well as mobile tariff dropped which turn give rise to wireless communication and now a day, it is already witnessing the cheapest telecom tariff globally.

The advancement of the telecom sector has experienced a major process of revolution in terms of its growth, technological content, and market structure in the last decade through policy reforms introduced by the Indian Government. The sending these signals at distance end at a much faster speed an reproduction of the same at far end.

The study tries to analyze that with the cut thought competition in mobile telecom sector, enhanced levels of customer satisfaction with reasonable prices and better quality of services is being delivered or not. As union of telecommunications, broadcasting, and

information technology progresses, wireless telecom and the Internet (Data) are anticipated to be the favored means of communication

During this period of rapid growth and transformation, this study also shows the helpful policy structure needs to be in present in present scenario. The Government of India has undertaken the work of execution telecom policy with utmost earnestness, in letter and spirit to shepherd in competition in almost telecom sectors. In growth of the mobile and basic service sectors, opting to revenue sharing in place of a fixed license fee, has led to a virtual 'take off".

Through private sector participation, liberalization of telecom sector of the Indian economy aims at improving connectivity, accessibility, availability and reliability to bring about much looked-for improvement in the Quality of Service (Q.o.S.). Due to increased competition, the mobile service providers are anticipated to become more responsive and sensitive to the subscriber's needs and hopefully they will give greater satisfaction to their esteemed subscriber. The Telecom Regulatory Authority of India (T.R.A.I.) has the directed to safeguard the subscriber's interests and to set the standards of Q.o.S. The speedy technological changes have brought about significant improvements in the quality of service provided to customers which have taken place in the telecom sector. With the installation of new generation exchanges, and up gradation of external outdoor network, the fault rate has come drastically down.

In the present status of digital communications and globalization, telecommunications service market is offering complex varieties of products and services to subscribers who are being invited to switch to other service telecom providers. There is neck to neck competition in this sector. Telecom operators are now aggressive for one another's

customers and more concentration is being given to cost calculating and low pricing techniques. Current telecommunications market is being developed by new universally imperatives technologies resulting in forceful competition. Hence, due to the high competition caused by the rising penetration rate and the unstable telecom environment and also because of the fact that the telecommunications sector which falls under service marketing has its own set of difficulties since its offered services which are intangible in nature. Telecommunication service providers are facing increasing challenges in retaining their current subscribers. Consumers have more alternatives in the intense competition market. The power in the GSM communications market has certainly shifted to the subscribers, irrespective of market conditions; it truly implies that the service providers should create long term and fruitful relationships with their subscribers. This research focuses the attention towards necessary actions and relationships which can create and deliver value instead of the core product-orientation plantings. As per (F. P. Reichheld & Sasser, 1990), current customers are more economical to maintain and less price sensitive than new customers. In a similar study (F. F. Reichheld & Schefter, 2000) found that new customers cost from 20% to 40% more than old customers, and in many cases the expenditure of acquiring a new customer is more than five to six times the cost of retaining an existing one (Alsemgeest & Smit, 2013) (F. F. Reichheld, 1996).

In telecommunications market, the operator-subscriber relationship is the main issue. Once a subscriber chooses a special telecom service provider, this "long-term relationship with the particular telecom operator is of bigger importance to the success of the company in competitive markets than it is in other industry sectors" (Gerpott, Rams, & Schindler, 2001 p 250). Hence, to achieve the desired marketing performance in such an

aggressive and vibrant telecom environment, service providers may need to change their marketing strategies from a relationship perception. In the meantime, the applications of value-based relationship marketing i.e. customer satisfaction and customer retention both together represent the two primary concerns of telecommunications service providers. Both parameters imitate telecommunications providers' preferred performance with regard to guarantee the common value generation for parties (Berry, 1995) and to keep active customers base, it is required to generate repeat purchase and creation of churn barriers (Andaleeb, 1996). The roads by which telecom service providers arrange their relevance to provide customer satisfaction and customer retention are being influenced by their adopted strategic visions and orientations (Day, Weitz, & Wensley, 1990) (Day & Wensley, 1988). Research on customer satisfaction in the provision of the telecommunications service in India is a valuable research area; since different aspects of customer satisfaction within the context of developing countries have not been given the due attention they warrant particularly in the services framework. It is worth noting that, in such a market place, in the face of the noticeable silence or lack of cooperation in research which is caused by competition, comparison to other regional countries, a feature which has been considered by both; private and public sectors in India. Moreover, Indian cellular operators' attitudes towards research are affected also by their planned partnerships with the international cellular operators who promoted their image as partners for the local communities and sponsors for social responsibility activities and research. As a result, telecom provision in India represents an appropriate field for conducting research as it has an more advantage compared to other sectors in which research is highly honoured and supported.

On the whole, it is seen that maximum of the customer satisfaction researches focuses on big cities considering only some aspects. However, the mechanisms that underlie the links between customer satisfaction and industries organizational performance remain unclear and not properly investigated, particularly in cellular mobile markets.

As a case study conducted in Indian cellular market, this work evaluates the interrelationships and mechanisms linking customer satisfaction with both quality of services delivered and customer loyalty. Thus, it represents an endeavour to accomplish a big picture of the different patterns that cellular service providers take on in order to manage the two essential organizational objectives in the cellular market (i.e. customer satisfaction and customer loyalty) in India as a developing and highly competitive market.

1.2 A Justification of the Research Theoretical Framework

A lot of researches have been carried out keeping the importance of the subject to examine the relationship between customer satisfaction and the network quality but the driver that connects customer satisfaction and network quality have not been studied sufficiently and remain a overlooked area that requires further quality investigations to uncover insides. One of the basic assumptions in marketing tactic is that a customer satisfaction is positively related to cellular operator's performance. Therefore this research can be conducted in this direction. The fundamental framework of this study considered mainly two main aspects;

- The effect of quality of service, perceived value, customer care services and tariff on customer satisfaction
- Its effect on customer loyalty.

Therefore, the research fundamental framework follows the perceptions of (White & Yanamandram, 2007) which indicated the combination of behavioural and attitudinal proportions of performance when evaluating aspects of a firm's organizational performance such as satisfaction/dissatisfaction repurchase intentions, retention and loyalty.

It is vital to note that the planned conclusion of applying the research structure is to allow for building a big picture regarding the behaviours and attitudes of telecom operator's managers towards those marketing actions thrusting on customer satisfaction and retention. This research is not proposed to examine the marketing practices of these cellular operators in depth. But it focuses to achieve further insight into the relationship between customer satisfaction and quality of service; customer satisfaction and customer loyalty, which constitute the base of the theoretical framework of the research. The construct of service quality has stimulated rational debate with current literature revealing deficiency of consensus on the measurement of service quality, keeping in view service intangibility, multidimensionality and heterogeneity (Marzo Navarro, Pedraja Iglesias, & Rivera Torres, 2005). In a typical review by (Kang & James, 2004) and (Tan & Pawitra, 2001) points during discussions in thought that the Service Quality (SERVQUAL) model discussed by (Parasuraman, Zeithaml, & Berry, 1985) is broadly acceptable in the measurement of service quality. Regardless of its widespread use, researchers continue to argue its complexness, practical working and conceptualization (Sureshchandar, Rajendran, & Anantharaman, 2002). Researcher's interest in measurement and development of service quality measures is attributed to the relationship between service quality and costs (tariffs), profitability, customer satisfaction and retention. Analysis of

the Profit Impact of Marketing Strategy data by (Buzzell & Gale, 1987) shown a positive relationship between perceived quality and organization's financial performance. In this regard , (Alves & Raposo, 2010) hypothesize that service quality has come out as an impetus to competitiveness and managerial strength

1.3 Statement of the Problem

For quality in service and manufacturing sector, analyzing Customer Satisfaction is a new approach and enables the growth of a customer-focused management and society. Measurement of Customer satisfaction offers an important and focused feedback about customer's options and needs. In present scenario, Customer Satisfaction research is very attractive growing segments of the marketing of service sector. Nowadays, Marketing and management science are focusing on the harmonization of all the institutional activities in order to offer goods/services that can satisfy best specific needs of existing customers. To strengthen customer orientation, an increasing number of companies choose customer satisfaction as their major performance parameter. However, it is almost impractical to keep all company permanently motivated by a notion as abstract and indefinable as customer satisfaction. Therefore, customer satisfaction must be converted into a number of quantifiable abstracts, directly related to people's satisfaction outcome. The very purpose of this thesis is to study what parameters/attributes contribute customer satisfaction and its association on various attributes of four major telecom operators in West Central India. Three states Rajasthan, Madhya Pradesh & Gujarat were chosen for this study. The relationship between service quality-customer satisfaction, service quality-customer care services, service quality-perceived value, service quality- loyalty based attributes were studied. The three

fundamentals of service quality and loyalty towards services represent constant challenges for the industrial financial performance. Now a day's customer intention analysis has also become chief factors in the business decision making and strategic planning processes. Present practice shows that by improving service quality one can expect better customer satisfaction levels. As a result, enhanced satisfaction levels should increase the likelihood of customer retention and degree of loyalty.

1.4 Objectives of the Study

The main objective of this thesis was to identify service quality attributes that were important to telecom service provider's practitioners. To achieve main goal, firstly researcher studied the relevant literature available and then used survey method to explore a variety of service quality items seem to be important to judge service quality. Subsequently, researcher developed a survey questionnaire tool to generate service quality perceptions, from customers of four major telecom operators (i.e. BSNL, Airtel, Idea and Vodafone) in West Central Indian region. Three states Rajasthan, Madhya Pradesh and Gujarat were selected randomly to conduct the research. Finally, a variety of suitable statistical tests were applied to analyze the data gathered. Outputs from this research would enable to the understanding of the service quality construct in relation to practicing telecom managers and planners of various telecom operators. The research objectives were broadly set as below:

Objective 1: To Understand the Mobile Telecommunication Market of India

Objective 2: To understand the Service Quality Delivery Models

Objective 3: To understand the Relationship of Customer Satisfaction with:

a. Network Quality

b. Perceived Value

c. Customer Care Services

d. Customer Loyalty

Objective 4: To study, service quality delivery level, being delivered by GSM service providers to customers and their comparisons on four constructs mentioned in objective 3.

Objective 5: To Measure the Overall Satisfaction with the help of constructs mentioned in objective 3.

Objective 6: Proposed Measures to be takes by service operators based on the study.

1.5 Research Hypotheses

From above discussion, following hypotheses were proposed to test various aspects undertaken in this research because a hypothesis is a proposition that can be accepted or rejected through empirical testing :

H_{01} There is no significant relationship between Network Quality and Customer Satisfaction among customers of different Mobile Telecommunication service providers in India.

H_{02} There is no significant relationship between Perceived Value (Value for Money) and Customer Satisfaction among customers of different Mobile Telecommunication service providers in India**.**

H_{03} There is no significant relationship between Customer Care Services & Customer Satisfaction among customers of different Mobile Telecommunication service providers in India

H_{04} There is no significant relationship between Customer Loyalty & Customer Satisfaction among customers of different Mobile Telecommunication service providers in India.

H_{05} There is no difference in Network Quality being provided by different Mobile Telecommunication service providers in India.

H_{06} There is no difference in Perceived Value (Value for Money) being experienced by customers of different Mobile Telecommunication service providers in India**.**

H_{07} There is no difference in Customer Care Services being experienced by customers of different Mobile Telecommunication service providers in India**.**

H_{08} There is no difference in Customer Loyalty among different Mobile Telecommunication service providers in India.

H_{09} There is no difference in overall customers Satisfaction being experienced by customers of different Mobile Telecom Service Providers in India

1.6 Scope, Significance and Limitations of the Study

A lot of research work has been devoted to explain the importance of customer satisfaction measurement for industries. Though, there are very few studies have been done on an overall integrating empirical research that relates the various elements of satisfaction with respect to service quality attributes in mobile sector.

Another reason behind conducting this research is declining profits of telecom companies may be arrested by analyzing reasons. Experiential data were collected from subscribers of these three states of West Central region of India (i.e. Rajasthan, Madhya Pradesh and Gujarat states) to conduct this quantitative research. Researchers showed that such an objective model is capable of capturing three dimensional relationships which will contribute towards more robust decision making and better strategic planning for practicing managers. The proposed thesis extracted the data about key service attributes from a combination of literature review, surveys, and interviews from the Indian mobile telecommunication industry. Responses were analyzed using SPSS V 22 by applying various statistical tests like Spearman's Correlation Analysis, Statistical Analysis (Summary of Statistics), F-Test (ANOVA), Post-hoc test etc.

This study tried to contribute to the body of knowledge in following ways:

(a) It Highlights the role of service quality parameters towards customer satisfaction, as a result identifies attributes that affect customer loyalty, retention and displeasure of customers,

(b) It identifies best mobile service provider in the states under study.

(c) It compares customer's satisfaction level interstate and intrastate and interstate.

(d) Proposes measures to Telecom operators, TRAI (Telecom Regulatory Authority of India and D.o.T.(Department of Telecommunications)

(e) Describes the relationship between each of Service Deliver, Perceived Value, Customer Care Services, Customer Loyalty and Customer Satisfaction.

This thesis presents a new methodology using constructs for customer satisfaction and various service qualities constructs. It is important to note that in this research work,

Customer Retention shows as chances of switching between service providers. Customer Loyalty is taken as a word-of-mouth activity by present customers. In present era, customers have to face the situations in which they have to choose the suitable (availability of network) and cheaper mobile service which are being claimed by various mobile telecommunications service operators across the country. Additionally, the mobile service operators also come across the situations that to meet the customer satisfaction in order to improve the market share. Hence, strategic planners of telecom service providers should be conscious of the factors affecting customer satisfaction and quality parameters in building these significant relationships.

In past, only a few studies on the service quality parameters, affecting customer satisfaction and loyalty in the Indian mobile telecom industry have been conducted. That's why; this study tries to find out, which parameters affect customer satisfaction in respect of mobile services. Besides, this research also tries to inspect the relationship between customer satisfaction and various quality parameters in cellular mobile communications service. This study was based on the customer's perspectives and their experiences with mobile communications service in three states of West Central India as mentioned above. As a data collection tool, **"Questionnaire"** was used in the present study. The conclusion indicated the quality of service, customer loyalty and perceived value play the key role in customer satisfaction. The study also indicated that customer care services do not lead to customer satisfaction.

The study remained focused on subscribers of West Central India. Only four major mobile operators of three states studied. The study didn't considered Landline and broadband subscribers due to resources and time constraints.

1.7 Telecommunication Sector of India

Telecom industry is one of the major fastest-developing industries in India. Presently India is the second-largest telecommunications market world-wide and has the 3rd utmost number of internet users. Its telephone subscriber base has grown at a CAGR of 19.96 per cent, reaching 1019 million during the year 2007–2017. In March 2017, total telephone subscription stood at 1019 million, while Tele-density was at 92 percent.

1.7.1 Brief History of Indian Telecommunication Sector

In our country, telephone service was commenced in Kolkata in 1881-82, just six years after the discovery of telephone. By the 1900, telephone had started contributing Indian Railways industry. The very first auto-telephone exchange was deployed at Simla in 1913-14 with a line capacity of 700. Though, in spite of huge efforts, the numbers of telephones were only 36.28 million till 2001 in the country. This resulted into approx. four telephones for every 100 persons. The telecommunication sector, thus, has exposed into remarkable industry and energy in the last one decade (2005 – 2015). The Indian telecom network has stretched from 44.96 million phones in March, 2002 to 1.19 billion connections (both fixed & wireless) as on 31st March, 2017. The Indian telecom network today is the second biggest in the world, next only to China. The sector of mobile telephone has shown a compound annual growth rate (CAGR) of 64 per cent per annum during 2002-2012.

The extraordinary increase in telephone network and rapid decline in tariffs in the Indian telecom sector have contributed considerably to the country's economic growth. It would not be decoration if remarkable growth, in the telephones, is termed as "Telecom

revolution in India". Main achievements in Indian telecom history are summarized in **Table: 1.1**

Table: 1.1 Milestone of Indian Telecom History

Milestone of Indian Telecom History	
Year	**Achievement**
1902	First wireless telegraph station established Between Sagar Island and Sandhead
1907	First Central Battery operated telephones exchange introduced in Kanpur
1913–1914	First Automatic Exchange was inaugurated and commissioned In Simla.
1927	Between the UK and India, Radio-telegraph system with beam stations at Khadki and Daund, started by Lord Irwin by exchanging greetings with the King of England on 23 July 1927
1933	First Radio telephone system installed Between the UK and India.
1953	12 Channels Carrier system installed which facilitated real-time calls on single pair.
1960	First subscriber trunk dialling (STD) route commissioned Between Lucknow and Kanpur
1975	New Telephone exchanges first PCM system commissioned. On single PCM , 30 simultaneous call traffic can be handled tested Between Mumbai City and Andheri
1976	First digital microwave junction was installed
1979	The very first optical fibre system for local junction was introduced at Pune
1980	Ist satellite earth station for domestic communications installed At Sikandarabad
1983	First analogue Stored Programmed Control exchange for trunk lines installed and commissioned At Mumbai
1995	Cellular Mobile Telecom service were commercially launched in India by issuing licenses to private operator.
	Mobile licenses issued for 19 more states
1995	At Laxmi Nagar, Delhi Internet services Introduced in India On 15 August 1995
1997	Govt. of India formed Telecom Regulatory Authority
1999	Govt. of India introduces new telecom policy (NTP)
	The fixed annual license fee with revenue share policy was replaced by Indian government
2000	A new method was introduced for subscriber linked spectrum allotment for real allocation of important resource.
	USO fund established to compensate operators. To improve the telecom services in the rural sector
	International Long Distance (ILD) services were offered for private sector without any limitations on the number of players.
	Bharati Airtel got listed In BSE & NSE in share market
2000	Videsh Sanchar Nigam Limited was privatized
2003	Access deficit charges (deficit) was introduced to facilitate BSNL

	Incoming calls were offered free.
	Unified Access License (UASL) Regime was brought. Operators were allowed to offer fixed landline / cellular mobile services using any technology.
	Reliance Communications started CDMA services which started tariff war
	Internet (Data Service) was allowed through cellular service providers
2004	National Broadband policy 2004 was announced.
2005	Govt. announced the FDI limit in telecom from 49% to 74%
	Manufacturing of mobile phone was started by Motorola.
	Infrastructure Provider tower companies entered the tower market.
	Different operators started the trend of recharge coupons with value ranging from Rs 10 to Rs 500 for low end prepaid users.
	Intelligent Network prepaid services lifetime validity scheme was introduced
	Maxis was taken over by Aircel
2006	Government launched 'Project Most' to promote passive infrastructure sharing
	Reliance Communications into Reliance Infra-Tel was demergered.
	Calls anywhere in the country were charged at a flat rate of Rs One by launching 'One India Tariff'
	India became the 5th country in the world. Entered in 100 million mobile subscribers' club.
	India further added 5 million subscribers in Aug-06 and overtook China to become the fastest telecom market in the world.
2007	Roaming Services were offered free
	Dual technology was permitted enabling service providers To offer both GSM and CDMA under the same license subject to entry fee of 1651 Cr
	Vodafone acquired 67% stake in Hutchison Essar paying US $10.9 billion
	Indus Towers was created by Vodafone , Airtel and Idea.
	For telecom UASL license and spectrum allocation 570 applications received
	DoT detached spectrum from the telecom license and introduced first come first served basis.
2008	DoT allotted 121 LOI for UAS(Universal Access) licenses.
	Government issued license to Six new players –Sistema, Datacom ,Loop Telecom, Shyam S-Tel, Unitech Wireless and Swan Telecom.
2008	Active infrastructure sharing allowed, whereby the operators are permitted access to feeder cables, common antenna, radio access network.
	Tele-density crossed 26%
2009	Bharti Airtel touched 100 million subscriber mark
	Mobile subscribers in India touched 500 million mark
2010	Aircel sold its stake of 17500 towers to M/s GTL
	3G and BWA spectrum sold through a open auction process. Government got Rs 67719 Cr for 3G spectrum and Rs 38543 for BWA spectrum
	Mobile subscriber base crossed 650 million
	3G spectrum given to Bharti Airtel, RCom, Idea, Aircel Vodafone, Tata tele services, and S.Tel.

2011	Nation-wide Mobile Number Portability (MNP) service launched
2012	National Telecom Policy announced
	2G Spectrum Auctioned in GSM and CDMA-S band. Earned Rs. 94.07
2013	No one participated in Spectrum Auction in 1800 MHz band.
2014	Spectrum Auction 2G in 900 and 1800 MHz Band. DoT Earned 612 billion
2015	Spectrum Auction 2G in 800 , 900 and 1800 Mhz Band. Govt. earned Rs.109874
2016	Spectrum Auction in 700 Mhz . Free Night Calling facility was introduced by BSNL
2017	Reliance Jio Launched its 4G services on Pan India basis and acquired 100 million customers just in few months.

1.7.2 Growth of Indian Telecommunication Sector

A study by GSMA revealed that, smart phones are expected to contribute 66 % mobile connections world wide by 2020 making India the fourth biggest Smartphone market. India is expected to lead in the growth of Smartphone acceptance globally with an predictable net adding up of 350 million by year 2020.

1.7.2.1 *Relationship between Growth of Mobile and GDP:*

The mobile telecommunication sector constantly to offer unprecedented chances for economic growth in both increasing and developed markets and mobile services have become an crucial part of how economic work and function.

The Impact of 3G Penetration on 3 G Growth

As technology develops mobile services have probable impact financial development further through the provision of high value 3G and 4G data services retrieved accessed through smart phones, Tabs and dongles that deliver mobile data services to commerce and consumers. For a given level of total mobile penetration, 10 % substitution from 2G to 3G increases GDP per capita growth by 0.15 % points.

The Impact of Data Growth on 3G Expansion

The increase in 3G connections which has been supported by the rise of data enabled devices allowed mobile internet connectivity, has led to a huge growth in the use of

mobile data traffic. Till now, examination of the economic impact of this transformation has been restricted by data availability. A double mobile data use enables an increase in GDP per capita growth rate of 0.5 % point.

Studies have revealed that there is a sufficient and positive co-relation between increase in penetration of internet including telecom services and growth of GDP. The study carried out by World Bank in 2009 using data of 120 developed and developing countries showed that a 10 % point boost in broadband penetration tends to a 1.3 % point boost in GDP per capita. In our country, the telecom sector has started leading to considerably to the overall economy of the country. The share of telecom as a percentage of GDP has gone from 0.96 % in 2001 to about 3.78 % at this time (Telecom Sector in India: A Decadal Profile, TRAI, Page 3). Furthermore, a recent case study undertaken by DOIT, Government of India, has shown that 10% addition in internet subscribers delivers, on an average, 1.08% rise in GDP. On the other hand, the growth was much higher at 2.36%, on an average, in states which had higher access of internet. Year wise growth rate with contribution in GDP is shown in Table: 1.2

Table: 1.2 Growth Rate (Over Previous Year) : Mobile and GDP

Year	Mobile (Million)	Growth (%)	GDP (Cr)	Growth (%)
1997	0.34		1876319	
1999	1.2	36	2087828	6.7
2001	3.58	89.8	2342774	4.3
2005	59.95	59.9	2971464	7
2009	391.76	50.1	4158676	6.7
2011	811.6	38.9	4937006	9.3
2013	867.81	(-)5.6	5503476	5
Parameter		Compound Annual Growth Rate(CAGR) in %		
	Period	2002-12	2002-07	2007-12
Mobile		63.65	89.98	40.97
Gross Domestic Product at Constant Price 2004-05		7.81	7.59	8.03

(Source: Economic Survey, Govt. of India)

The first-time increase in mobiles during 2002 to 2012, which saw a CAGR of 64% per year and sharp decline in tariffs in the Indian telecom sector have contributed significantly to the country's financial growth. GDP amplified by CAGR of 7.59% during 2002-07. This improved to 8.03% during the Eleventh Plan (2007-12). CAGR during the 10^{th} and 11^{th} Plan was much higher when compared to the CAGR of 6.6% and 5.7% during the 8^{th} (1992-97) and 9^{th} Plan (1997-2002) respectively.

In the light of above facts it's clear that the Indian Telecom sector is one of the fastest growing sectors worldwide. These services have been recognized world-over as a major tool for socio-economic progress for a country and play a amazing role in growth and transformation of different sectors of the economy. Over the last some years, Indian telecommunication market has witnessed overwhelming growth, due to policy measures

undertaken by the government and marvellous efforts by the players of the industry and in the process, has accomplished to come forward as one of the youngest and best ever growing economies in the world in present. Various factors like structural betterments, policy relaxation and competition played a very critical part in this speedy change.

The fact that India is one of world's fastest growing telecommunication markets, has acted as the prime driver for foreign and home telecommunication industries investing into the sector. It is also known as one of the most profitable markets world-wide, resulting in massive investments being made in the sector by the private as well as government sector in the last decade.

1.7.2.2 Growth in Telecom Sector during last Eleven years

The telecom sector of our country has shown a considerable expansion in subscriber base over the last decade, with growing network coverage and a competition-resulted into declining tariffs acting as trigger for the increase in subscriber base. This development phenomena and the future potential have also started to attract newer companies in the telecom sector, with the result that the power of competition has kept raising. The growth trip of Indian telecommunication sector during the last eleven years has been given in

Table: 1.3

Table: 1.3

Growth in Telecom Sector during last Seventeen Years

S. No.	Year	Telephone Connections in the country (in Millions)					Telephone Connections Provided by BSNL (in Millions)					% Telephone Market Share of BSNL				
		Wired Line	Wireless			Grand Total	Wired Line	Wireless			Grand Total	Wired Line	Wireless			Grand Total
			WLL	GSM	Total			WLL	GSM	Total			WLL	GSM	Total	
1	31.03.01	32.51	0.07	3.58	3.65	36.16	28.11	0	0	0	28.11	86.46	0	0	0	77.73
2	31.03.02	38.07	0.46	6.43	6.89	44.96	33.2	0.2	0.02	0.21	33.42	87.21	43.1	0.27	3.11	74.33
3	31.03.03	40.75	1.14	12.69	13.83	54.57	35.42	0.52	2.26	2.77	38.19	86.92	45.3	17.78	20.05	69.98
4	31.03.04	40.92	9.47	26.15	35.62	76.54	35.44	0.96	5.25	6.21	41.65	86.6	10.1	20.09	17.44	54.41
5	31.03.05	41.35	16	41.07	57.07	98.42	35.86	1.63	9.45	11.08	46.93	86.72	10.2	23.01	19.41	47.69
6	31.03.06	41.56	29.7	69.2	98.9	140.46	35.42	2.57	17.16	19.74	55.16	85.22	8.66	24.8	19.96	39.27
7	31.03.07	40.77	44.6	121.43	166.05	206.83	33.74	3.56	27.43	30.98	64.72	82.75	7.97	22.59	18.66	31.29
8	31.03.08	39.42	68.4	192.36	260.74	300.15	31.55	4.58	36.21	40.79	72.34	80.05	6.69	18.82	15.64	24.1
9	31.03.09	37.91	103	288.39	391.34	429.25	29.35	5.43	46.71	52.14	81.49	77.42	5.28	16.2	13.32	18.98
10	31.03.10	36.94	163	421.68	584.41	621.35	27.83	6.14	63.31	69.45	97.28	75.34	3.78	15.01	11.88	15.66
11	31.03.11	34.72	226	585.68	811.6	846.33	25.22	5.57	86.27	91.83	117.06	72.64	2.46	14.73	11.32	13.83
12	31.03.12	32.15	224	695.76	920.1	952.25	22.47	4	94.51	98.51	120.98	69.88	1.78	13.58	10.71	12.7
13	31.03.13	30.21	171	696.89	867.79	897.99	20.45	2.7	98.5	101.2	121.65	67.69	1.58	14.13	11.66	13.55
14	31.03.14	28.49	154	750.18	904.55	933.04	18.49	2.25	92.4	94.65	113.14	64.9	1.46	12.32	10.46	12.13
15	31.03.15	26.56	156	813.7	969.54	996.1	16.41	1.98	74.84	76.83	93.24	61.8	1.27	9.2	7.92	9.36
16	30.11.15	25.68	148	861.51	1,009.60	1,035.31	15.36	1.5	80	81.49	96.86	59.83	1.01	9.29	8.07	9.36
17	31.03.16	25.18	150	883.81	1034.2	1059.38	14.76	1.4	85.42	86.82	101.58	58.63	0.93	9.66	8.4	9.59
18	31.03.17	24.38	54	1007.04	1170.7	1195.06	13.69	.96	100.4	101.4	115.09	56.15	1.75	9.97	8.66	9.63

Opening of the telecom sector has not only started quick growth but also gave a great deal towards growth of consumer benefits, clear from a enormous fall in tariffs. Telecom sector has witnessed permanent rising trend in the total number of telephone subscribers. From 22.8 million telephone subscribers (wireless plus wire line) in 1999, it has grown to 1.19 billion at the end of March, 2017, reaching Tele-density of 91.92 % in the country with the Delhi license at top (253%) and Bihar License area at the lowest (60%) . The total number of urban subscribers stand at 782 Million (67.98 %) and rural subscribers at 368 Million (32.0 %). Wireless telephone connections have contributed to this growth as

the number of wireless connections rose from 35.61 million in 2004 to 119 Million at the end of March, 2017. The broadband (wired) density in the country was 14 % as on 31.03.17. Also, broadband segment has seen significant growth with total internet subscribers reaching 302.35 million in November, 2015, which includes 19.07 broadband wire line subscribers. The industry has touched newer heights with the rollout of newer circles by operators, successful auction of third-generation (3G) and broadband wireless access (BWA) spectrum, network rollout in semi-rural areas and increased focus on the value added services (VAS) market. Meanwhile, the introduction of Mobile Number Portability (MNP) in India has made the Indian Telecom market more competitive, in terms of service offerings and quality.

With decreasing voice tariffs and low ARPUs in India, emergence of new technologies and developments towards 3G amongst others reasons are stimulating operators to shift their focal point on VAS. Above all, last few years have been quite revolutionary for the industry as it shown the appearance of smart phones; GPS enabled sets, and 3G/4G VoLTE handsets. An agenda to connect the rural customers is already marked with service providers' tie-ups with content providers for services related to farming, cultivation, weather forecasting, and living.

The development of the mobile telecom era has assisted people across all sides of life of everyone. Additionally, it is predictable to play a major role in joining the digital divide between the rich and poor, between nearer and apart, thus in linking the country. It has not only become the major communication means for people, but is also fallout many uses across different disciplines. Now a day, it is being used for business transactions, digital payments, acting as a learning and multimedia tool, and so on.

Although, the need is to provide services that could facilitate efficient day-to-day life for the subscribers' easiness. It can be proficient mode of partaking governance, and can also be used across different areas such as trade, agriculture, media, weather fore casting, agriculture, healthcare, e-commerce, digital transactions and e-Mandi etc. The quick rise of complicated mobile phones (smart phones) has enabled the customers to use and develop many software applications as utility or for enjoyment, recreations, recreation, leisure etc.

The rapid speed of growth in telecommunications in India makes it necessary to develop India as a Global telecom infra centre. Due to its proven track record in the skill-based sectors and the worldwide trend to make up and source products in low cost countries, India has proven to come out as one of the most important centre for mass-produced exports.

The revenue growth is rising by approximately 15 % per annum. Indian government has given an encouraging environment for all service providers. As a result, the sector has become very attractive and the services are available up to the reach of last mile in every part of country at very realistic and affordable tariff. The mobile services market is diverting from voice services to data (Internet) services rapidly. Latest 3G and 4G/VoLTE technologies are available in different major cities and districts.

There will be huge growth in coming years as the government also established many projects like Digital India campaign, Hot Spots, Smart City program, creation of Wi-Fi zones and E-Mandi around import tourist & commercial places etc. Over 1.1 billon US$ investment will be done in these programs. As per study of GSMA (GSM Association) 67 % mobile phones will be smart phones by 2020. The overall Tele-density of India is

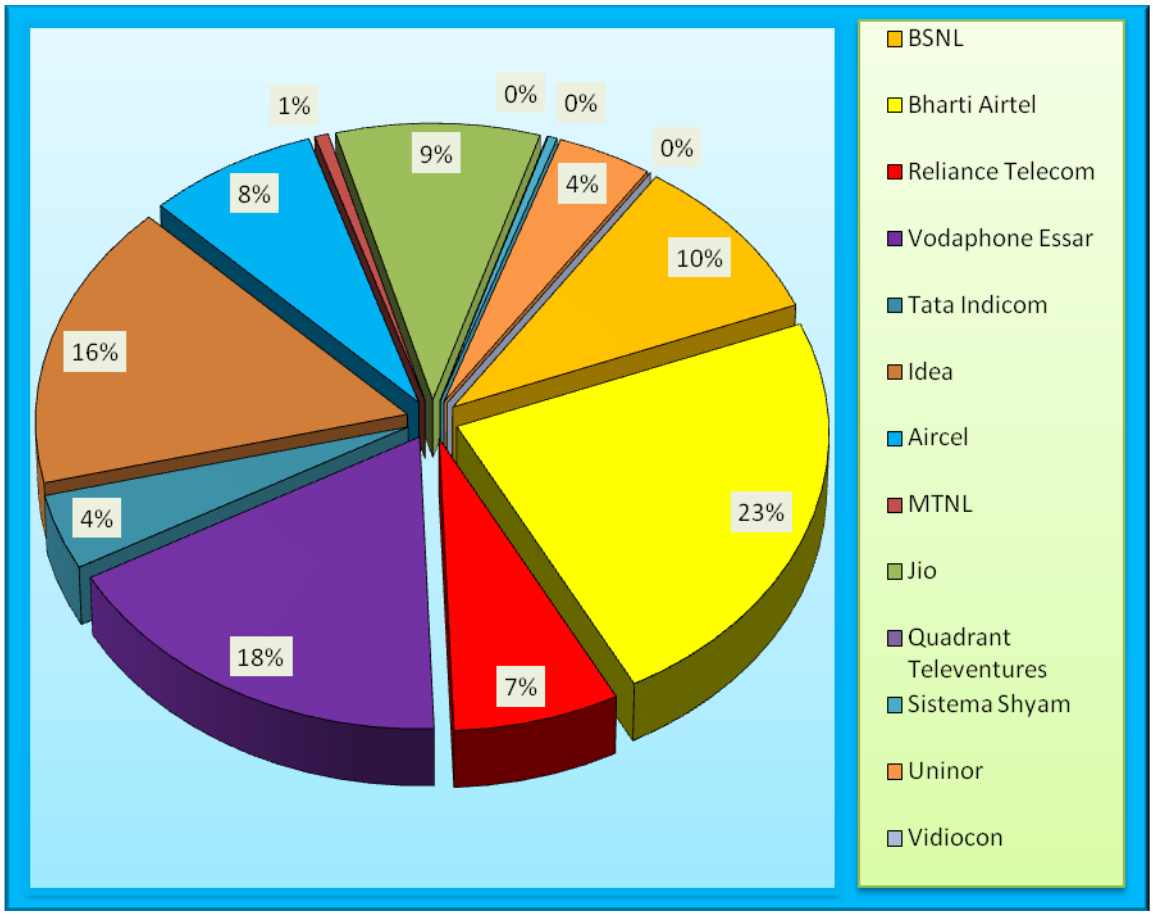
91 %. Total connections have reached the mark of one Billion (as on 31.03.17). The detail of operator-wise market share is shown in **Table-1.4** and graphically represented in **Chart-1.1** as on 31.03.2017:

Table-1.4

Operator-wise Market Share as on 31.03.17

S. No.	Name of Operator	Telephone Connections (in Millions)						% Telephone Market Share					
		Wired Line	Wireless				Grand Total	Wired line	Wireless				Grand Total
			WLL	GSM	LTE	Total			WLL	GSM	LTE	Total	
1	BSNL	13.6	0.96	100.44		101.40	115.09	56.15	1.75	9.97		8.66	9.63
2	Bharti Airtel	3.87		273.65		273.65	277.51	15.86		27.1		23.38	23.22
3	Reliance	1.17	0.00	83.50		83.50	84.68	4.82	0.00	8.29		7.13	7.09
4	Vodaphone	0.14		209.06		209.06	209.20	0.57		20.7		17.86	17.51
5	Tata Indicom	1.75	48.9			48.99	50.74	7.18	89.1	0.00		4.19	4.25
6	Idea			195.37		195.37	195.37			19.4		16.69	16.35
7	Aircel			90.90		90.90	90.90			9.03		7.76	7.61
8	MTNL	3.44	0.09	3.63		3.72	7.16	14.12	0.16	0.36		0.32	0.60
9	Jio				108	108	108				100	9.28	9.09
10	Quadrant Televent.	0.26	0.00			0.00	0.26	1.08	0.00			0.00	0.02
11	Sistema Shyam	0.06	4.91			4.91	4.97	0.23	8.94			0.42	0.42
12	Uninor			50.49		50.49	50.49			5.01		4.31	4.23
13	Videocon			0.00		0.00	0.00			0.00		0.00	0.00
	Total	24.38	54.96	1,007.04	108.68	1,170.68	1,195.06	100	100	100	100	100	100

Chart-1.1 Market Share in % as on 31.03.17



(Source: www.intranet.bsnl.co.in)

Presently only 40% mobile phones contribute smart phone market. As per ongoing trend, by 2020, the penetration smart mobiles phones will boost three times. Due to declining cost, ease of procedure, improved functions, better 3G/4G network coverage, smart mobile phones are becoming choice of all mobile customer in every part of world. Most of the daily routine essential activities are being accomplished through use of smart phones such as education, grocery shopping, health care services, various insurance services, entertainment, insurance, matrimony, learning, recruitment , complaints

(monitoring ,disposal and feedback), banking, personal individuality (Aadhar) and so on uncounted. Presently 30 % subscribers are urban and 70 % are rural. The requirement of smart phone is increasing in rural areas as per our survey. The mobile Apps market is also growing by the rate of 70 %.

All the above mentioned services are data driven. They need an internet connection required. The network quality of services providers plays very important role to use these services. Customer service is another fundamental dimension for a service provider because it is the stage where a customer contacts with a company or vice versa. Consequently, when they have a question or Product/Service issue, they expect a company's customer service department to solve their issues. It is also important for a company because it can help to distinguish a company from its opponents.

The purpose of the study is to evaluate the extent to which the fundamentals of quality management are being accomplished by Telecom operators in India, identify hurdles and to recommend actions for improving their aggressiveness by following best quality practices. This study tried to recognize the gap in customer satisfaction levels, by measuring quality of service being rendered to customers of mobile services in West Central Indian region.

1.7.2.3 Financial Implications

According to research firm IDC, due to increasing data consumption on handheld devices, the total mobile services market revenue in India is predictable to touch US$ 37 billion in 2017, which will result a CAGR of 5.2 % between 2014 and 2017. As per data given by Telecom Minister Mr. Ravi Shankar in parliament in Dec,15, revenue generated by the telecom sector during 2014-15 increased to Rs 2,42,900 Crore,

accounting for 1.94% of total GDP. FDI has been one of the major contributors in the growth of the Indian market, and therefore, the need for higher FDI is felt across sectors in the Indian economy. The Indian telecom industry has played a vital role in inviting FDI. India's telecom sector acknowledged US$ 2895 million in foreign direct investment (FDI) during the financial year 2014-2015. Today, telecom is the third major sector attracting FDI inflows after services and computer software sector. In the telecom sector, FDI up to 49% is allowed under automatic route and beyond that up to 74% is permitted through the Foreign Investment Promotion Board, which is a government body. FDI in Capital is 100 % allowed. As per the current telecom services policy, the sector has 74% of equity on basic cellular, unified access services and other value-added telecom services.

An attractive trade and investment policy and beneficial incentives for foreign collaborations have made India one of the world's most attractive markets for the telecom equipment suppliers and service providers. Few such beneficial policies are:

- There is no need of industrial license for setting up manufacturing units for telecom equipment.
- Through automatic route 100% FDI is allowed for manufacturing of telecom equipments/components.
- For use of trademark/brand name on the automatic route, payments for royalty, onetime fee for transfer of technology and payments.
- For telecom services - basic, cellular mobile, paging, value added services, NLD, ILD, ISPs - and global mobile personal communications by satellite, foreign equity of 74% (49 % under automatic route) is allowed

- In the telecom sector, full repatriability of dividend returns and capital invested.

1.7.2.4 Research & Development

As a technology solution leader, India has established its superiority. Extensive efforts are being constantly made to develop inexpensive technology for customers, as also comprehensive security infrastructure for telecommunication system. Research is on for the preparation of tested communications for enabling interoperability in Next Generation Network (NGN). Model projects on the current and forthcoming technologies have been formulized which includes Wi-Max, 3G, 4G (VoLTE) etc. Due importance is being given to technologies having capacity to improve network in rural and last mile areas across the country. Also to expedite R&D infra in the telecommunication sector and link the digital divide, cellular companies, apex educational institutions and the Government of India together set up the Telecom Centres of Excellence. Such seven Centres of Excellences in various field of Telecom have been set up with the affiliation of Government and the involvement of private/public telecom operators as sponsors, at the selected educational institutions in across the country. Following benefits from the R&D initiatives taken by the Government are as under:

- Dominance of India as a knowledge solution hub.
- Absolute security infrastructure for cellular/telecommunication system.
- Weathered network for enabling portability in Next Generation Network (NGN).

To support R & D activities the India and giving boost to start ups focused on novelty and technology, a handsome deduction of 150% of expenses done on in-house R&D activities is introduced under the Income Tax Act. Additionally, the current system for funding different R&D projects has been funded in the course of new scheme like

Multiplier Grants Scheme, Support International Patent Protection in Electronics etc.

The government has taken a number of steps for setting up of an Open Technology Centre through NIC planned at giving efficient direction to the nation on Open Technology in the areas of Open Source Solutions, Open Processes, Open Standard, Open Course-ware and Open Hardware specifications . This proposal will act as a National Knowledge facility providing synergy to the overall mechanism of Open Technology worldwide.

BBNL (Bharat Broadband Network Limited)

The Bharat Broadband Network Limited was came in picture on 25 Feb, 2012 with the attempt to perform the business of management , establishment and operation of NFON and with a prospect to give high speed broadband connectivity to all Gram Panchayats across the country by continuing the present and upcoming OF network to give right of entry to bandwidth in a non- bigoted way to all appropriate telecom service providers.

USOF: Universal Service Obligation Fund, DoT, Ministry of Communications & IT, is providing the fund. NOFN is the chief rural connectivity system of its kind globally. It is planning to connect each of the 2.5 Lacks GPs across the country through Broadband OF network. After it, NOFN is supposed to assist Broadband connectivity to 600 million rural subscribers of the India. It is predictable that the organization of NOFN would not only have a change affect on the lives of Indians, but it would also open up new ways for ASPs such as Telecom Service providers, Cable TV service Operators, ISPs, Content Service Providers and so on. To launch New Generation services and recommend creation of local employment chances surrounding IT outsourcing, e-commerce, rural

business process outsourcing etc. as well as services such as e-Mandi , e-banking, e-health and e-education for total growth. This will also facilitate delivery of various services such as local banking development, management, monitoring, facility management and payments under Government plans at Gram Panchayat level.

Currently the project under NOFN is being carried out by three CPSUs namely BSNL, PGCIL and Railtel under the Phase-One. The GPON is the Main feature of the project. This is the equipment used in the project has been designed in our country and developed and supported by C-DOT and manufactured. This project is being organised by BBNL using a high potential NMS being deputed by C-DOT. Knowing the importance of Bharat Net project, exclusively with respect to connecting the huge digital divide, important point is being put on timely and effective commencement of the project. Since the time, the Govt. has come to authority; the speed of completion of the project has been considerably boosted. Three motivated Pilot Projects have also been finished to cover 59 Gram Panchayats in North Tripura District, in Ajmer District in Rajasthan, and in Vishakhapatnam District in A.P.

1.8 Regulations

The Indian telecom sector is largely accomplished by following acts/regulations:

1. **The Indian Telegraph Act, 1885**: This Act is one of the oldest acts, which is still in effect and is an Act to alter the law relating to telegraphs in India.

2. **The Indian Wireless Telegraphy Act, 1933**: This Act was introduced to regulate the possession of wireless telegraphy equipments. As per this Act, the possession of wireless telegraphy equipments by any individual can only be permitted in concurrence with a license issued by the telecom authority. Additionally, the Act also imposes

penalties if any wireless telegraphy equipment is held without a valid license.

3. The Telecom Regulatory Authority of India Act, 1997: This Act, 1997 give rise to the establishment of the TRAI. The workings and role of the TRAI have already been explained. The 1997 Act gives power to TRAI with quasi-judicial authority to give a ruling upon and resolve telecom disputes. Afterwards this Act was transformed by the TRAI -Amendment- Act, 2000 to obtain in better clarity and difference between the regulatory and recommendatory functions of TRAI

4. The Information Technology Act, 2000: The Indian Parliament passed the Information Technology Act-2000 in the 2000, mainly to promote e-commerce/trade and give legal recognition to electronic documents and digital signatures as means to validate electronic papers. Thereafter, the Information Technology Act, 2008 was passed which gave supplementary focus on information security as well as added some novel sections on offences together with cyber terrorism and data security.

5. Communication Convergence Bill: The Government of India introduced a planned Communication Convergence Bill, in the year 2000. The purpose of the Convergence Bill is to set up a new "converged" regulatory structure to support and develop the telecommunications sector (including telecommunications, broadcasting, internet, data and "multimedia) in an environment of rising junction of technologies, services and service providers.

6. Consumer Preference Regulations Bill: Under section- 11 of the TRAI- Act, 1997, Telecom Commercial Communications Customer Preference Regulations, 2010 came into existence on 01.12. 2010. This act is pertinent on "Cellular Mobile Telecom Service Provider, "The Basic Telephone Service Provider"," and "Unified Access Service

Provider-(UASP)". As per this act, Each Service Provider will set up a Customer Preference Registration capability, both for wire-less and wire-line technologies, for activation/ deactivation of their favourite regarding receipt of commercial communication, in the Provider Customer Preference Register.

1.9 National Telecom Policies

In the last decade, The Indian telecommunication sector shown a whole transformation determined by various policy initiatives from NTP-94 and NTP-99, but, since then there has been a speedy progression of technology, and many makeovers have taken place in the telecom sector globally, thus, giving rise a need for reconsidering the current telecom policy. NTP- 2012 is likely to ensure that India's growth doesn't slow down and it plays a guidance role powerfully.

Challenges

Although the Indian telecom industry has journeyed a long way since the time of globalization and promises growth, there are a lot of identifiable factors which still presents a challenge to its development. Two grave issues are as under:

- **Sharp Declining Average Revenue / User:** The Indian telecom industry is a very high aggressive and competitive sector. A constant price war in the industry has given rise in downing ARPUs. As a result, cellular service providers are pin pointing more on internet data and VAS to meet the revenue shortfall caused by fall in revenue by their main business.
- **Need of Upgradation Telecom Infrastructure**: Cellular Operators have to experience huge capital costs to offer telecom services in the rural/tribal areas across the country. Furthermore, additional to these spending is the fundamental challenge posed by

the lack of beneath infrastructure such as lack of transportation and electricity system. With entry of new players in telecom sector, the potency of competition in the industry has augmented, principally over the last 5-7 years. The market share of the telecommunication companies shows the uneven nature of the sector, with as many as 14 players.

Future prospects of India Telecom Industry:

Indian telecommunication industry may be an example for countries growth story over the last 10 years period. In last four-six years, this sector grew by 20% CAGR and the cellular subscriber base touched 1000 million, second to China only. Telecommunication sector contributes approx. 3% to India's GDP. More prominently Telecommunications, along with Information Technology, has offered the platform for speeding up of the economic and social growth of the country across all sectors. It has enabled the small industrialist, whether it is a daily worker, a carpenter or an electrician/washer man, vegetable merchant; as much as it has given rise to the growth of companies rely on worldwide e-Trade. The country is totally dependent on the immediate voice and data communication given by the telecom networks; this enslavement is permanent.

To drive Indian economy, the DoT is accurately using telecom industry as an successful medium to reach and serve the "common man', particularly BPL families in rural at last mile at cheapest rates. The National Telecom Policy has aimed 100% Tele-density and 600 million broadband connections to be achieved by 2020. It includes linking 250,000 Gram Panchayats by OF core network. This will give rise to the demand for an additional 400,000 BTS (Towers) average holding of 2.3 at an investment of

Rs.50, 000 Crores. In actual fact, the NTP is judging a 200% the present telecom capacity and growing its penetration to 95+ % of Indian households while providing broadband level of internet potential.

This development occasion should have acted as magnetism for significant FDI in the cellular sector. In its place, it is seen, a perfect twister in telecom sector that has boost away investment. Unfortunately the self-confidence of investors in this sector is now at least level. This is understandable from the decreasing FDI. In the year 09-10, telecom sector fascinated USD 2.5bn FDI (10% of total FDI); On the other hand in the year 2012-13, Indian telecom sector inward USD 303 million FDI. The telecom sector has outstanding future prospects, but it can attract investors only if country can build up sustainable long term policies and a favourable impression for Government and this sector to work as partners – not as adversaries. The statement of FDI in last seven years is given in following **Table 1.5:**

Table-1.5 Statement on Financial Year Wise FDI Equity Inflows

Year	in Rs. (Crore)	in US$ (million)
2009-10	12,269.66	2,539.26
2010-11	7,542.04	1,664.50
2011-12	9,011.53	1,997.24
2012-13	1,654.30	303.87
2013-14	7,987.28	1,306.95
2014-15	17,372.32	2,895.02
2015-16 Apr-May	2,320.27	363.75

The 2G scam hard-pressed the country into a hard position with the abrupt cancellation of 122 telecom licenses in 2012. Messy attempts to resolve the disaster have

left the industry even more concerned than ever before. All of this has shaped a huge sum of negative publicity and disheartened investors, both international and domestic . The Vodafone tax case has been tired on since 2007. The state of affairs became dangerous, restrictive terms for the auction of spectrum from the cancelled licenses, and unnaturally high reserve prices led to an ineffective auction as market forces were not allowed to choose the value of the spectrum. As a result, some key Circles like Mumbai, Delhi and Rajasthan had no bids. Only some operators opted out of the business completely, while remaining chose to limit their selection. Additionally, the DoT is approaching forward with changes such as one time license fee for spectrum, offering of the 900 MHz band far along of 2014 when new operators need to renew their licenses. The overwhelming majority of operators feel these makeovers are not fruitful and are being enforced on a sector when it is already harassed to recover from the shocks produced by the earlier decisions. This framework will have significant cost implications for the sector which will inescapably be passed on to the consumer.

The tower infrastructure sector, which has equipped Indian telecom expansion by investing over Rs. 100,000 Cr in the last 15 years, sees a contradictory situation. On one way, the tower sector has been approved infrastructure status in acknowledgment of the major role it plays in increasing telecom/ internet coverage. On the other hand, the TRAI has planned that tower companies that lease infrastructure to Telcos, and no services to the subscribers, be forced to run under the same Unified License that mobile operators, LD operators, and Internet Providers(ISPs) etc. Under the planned unified licensing system, supplementary license fees of 8% will be compulsory and the FDI limit be decreased from 100% to 74%. For a sector which is still under pressure, to meet its cost

of capital, this tax levied form old date on preceding investments may be the last straw that breaks the camel's back creating it unlikely that tower sector will do further investments in ongoing installation of the 50,000 new towers needed.

In the similar way, the DOT is considering a vision of 'green telecom', which is a greeting initiative. However the goals set for Phase-First alone, to convert 50% of urban and 30% of rural towers to renewable energy are impractical in the opinion of experts like TERI (The Energy and Resources Institute).

On line, in this standpoint, this will need 1500 MW of solar power, which exceeds the total current domestic non captive solar capacity of the country to be generated on structure rooftops and village sites with a Rs. 40,000 Crore asset.

For a Telecom industry that is already under pressure, all of these planned measures have grave financial implications for effectiveness. If country wants the Telecom/Broadband Internet growth to achieve the set targets mentioned in the Telecom & Broadband policies, it is needed to pursue an unusual path. It is required that the Government puts in practice its often stated goals of getting voice coverage to every citizen, and broadband data down to every Gram Panchayat level. This is necessary to enable not just cash transfers but e-Mandi, e-Governance, e-Health and e-Education. This goal has to be used as an superseding criterion for approval of all telecom policies and practices. Telecom sector should no longer be taken as a golden goose. In this current situation, the government should think a series of actual steps that are right away required to refurbish the positive sentiment in the market and to draw FDI :

- ✓ Make sure that all proposals include a cost-benefit analysis from the viewpoint of consumers, investors, cellular service providers and the Government.

- ✓ Prepare a 5 year roadmap for prospect spectrum availability and timing; conduct transparent auctions for these well before the time limit.
- ✓ Auction all left over spectrum with reserve prices set at 2001+ inflation, the price should be left on market force; the number of competitors in Telecom sector and the deep feuds between them will make certain that conspiracy is improbable.
- ✓ Reorganize the idea of spectrum re-farming; there is no model anywhere for migrating 400 million subscribers from one band to the other.
- ✓ Turn down the proposal of pressuring tower companies to become USO providers and leave them as Infrastructure Industries. Give USO funding for getting telecom infrastructure built in 20% of India that does not have proper coverage; make this in PPP mode with the Government's NOFN (National Optical Fiber Network) backbone to get Broadband down to the village level up to last mile.

Don't treat telecom sector as a cash cow and emphasis on what needs to be done to execute ubiquitous wireless broadband as contemplated in the **'Broadband for All'** plan. Country can pick up from the recent Telecom disaster, and once again become the leading Telecom market in the world. The "last mile man" should be offered with it and will demand this of the bureaucrats, politicians and the cellular operators.

Country offers an matchless chance for telecom service operators, infrastructure vendors, manufacturers and linked services companies. A host of factors are contributing to distended chances for growth and investment in cellular mobile sector:

- A growing up Indian economy with amplified spotlight on the services sector
- Population mix heading positively towards a younger age profile Urbanization with rising incomes

Fund providers can look to capture the gains of the Indian telecom explosion and enlarge their operations outside developed economies that are marked by flooded telecom markets and lower GDP growth rates. A stunning trade and investment policy and lucrative incentives for foreign collaborations have made India one of the world's most lucrative markets for the telecom equipment suppliers and service providers. Main factors, which will further fuel the growth of this telecom sector include : augmented access to services owing to launch of latest telecom technologies like 3G/4G (VoLTE) and BWA, better devices, changing consumer behavior and the coming out of cloud technologies. Most of the investments will go into the capital expenditure for establishing newer networks like 4G and developing the backhaul/alternate routes. Furthermore, the beginning of Mobile Number Portability in India has made the Indian Telecom market more cutthroat, in terms of service offerings and quality.

With the awareness being spreading out, the world on the Information and Communications Technology, in the afterward part of the 20^{th} century countries, particularly the developing ones, began to understand the importance of an efficient

telecom network for the development of the economy. At the commence of the 21st century, the developing countries started to make complete use of the technology revolution taking place around the world, with a lot of countries liberalizing the existing harsh policies and system. To rise up information and telecommunication technology, 189 countries of the UN met at the Fifty-Fifty General Assembly on September 2000.A millennium statement was made, which says: the countries reaffirmed their commitment to improve the living conditions of poor and browbeaten in the world by adopting intense poverty programs. One of the main targets of this declaration was support to "In co-operation with the private sector make available the benefits of new technologies, particularly information and communication". The parameters that were to be used for ensuring the improvement were:

- Telephone line and cellular subscribers, per 100 units of population.
- Personal computers (PCs) in use for 100 units of population.
- Internet/Broadband user per 100 units of population.

Even before the statement, many developing countries had started liberalizing their internal regimes to facilitate efficiency as to affordability as and reach ability of telecom system. By 1995, majority of the low income developing countries of the world, made their economies worldwide, by liberalizing the home licensing and important policies on the whole, to make easy inflow of foreign capital into the infrastructure sector, particularly in the telecom sector. This created a telecom revaluation, with countries considering liberalization initiates, viewing a never-before growth in the telephone network, together with the penetration levels. Developing countries today account for

49% of the total telecom network in the world. Whereas in East Asia (including China) the total tele-density grew at a rapid pace to reach 27.4 in 2002 the Tele-density grew at a slower pace in south Asia, to reach 4.5 in 2002. This was due to deficiencies in government licensing system in the 90s in most of the South Asian countries. As there was undue development in ICT among the developing countries in individual growth in telecom sector, country-wise also reveal a partial development, where the development in other areas apart from mobile was snail-paced. This was due to exceptional growth in the cellular segment, whose major part was toward metropolitan telephony.

Like elsewhere, telecom sector in India started as a state monopoly. In the 1980s, telecom services and postal services came under the Department of Posts and Telegraphs. In 1985, the government divided the Department of Post and created the Department of Telecommunications (DoT). As part of early reforms, the government set up two new public sector undertakings: Mahanagar Telephone Nigam Limited (MTNL) and Videsh Sanchar Nigam Limited. MTNL was responsible for telecom operations in two metros, Delhi and Mumbai. VSNL provided international telecommunication services in India. D.o.T. sustained to provide telecommunications operations in all states other than Delhi and Mumbai. It is significant to note that under this system, telecom services were not treated to be a need that should be made available to all people but rather a luxury possible for only select few.

In the early 1990s, the telecom sector in India, which was owned and governed by the Indian government, was relaxed and private sector participation was allowed through a steady process. First, telecom equipment manufacturing sector was totally deregulated.

The government then permitted private players to provide VAS, such as paging services etc. In 1994, the government brought the National Telecom Policy 1994. This recognized that existing government resources would not be sufficient to achieve telecom growth and hence private investment should be permitted to fill the resource gap especially in areas such as basic and internet services. As markets and telecom technologies started converging and the gap between voice and data networks started diminishing, the want for developing the modern telecom network became an instant necessity. Therefore, private sector participation was permitted in basic services.

The government expected that a major part of the growth of the country's GDP would be dependent on direct and indirect contributions of the telecom sector and therefore the need for a complete and forward looking telecommunications policy was needed. This then created way for New Telecom Policy 1999 which mainly focused on creating an environment for attracting nonstop investment in the telecom sector and allowed creation of communication infrastructure by leveraging on technical development. The key objectives of NTP 1999 were as below:

- Availability of reasonably priced and effective communications for all Indian citizens;
- Try to provide a balance between the provision of universal service to all untouched areas, including the rural areas and the stipulation of high-level services capable of meeting the needs of the country's economy;

- Generate a modern and competent telecom infrastructure taking into account the convergence of telecom, consumer, IT and media;

- Defend the defense and security interests of the country.

NT Policy 1999 permitted private operators providing mobile and basic services to shift from a fixed license fee policy to a revenue sharing policy which made it economically viable for such operators to function in the market. Most prominently, the government acknowledged the necessity to separate the government's policy wing from its operations wing so as to create a level playing field for private service providers. Accordingly the NTP 1999 aimed at the separation of the policy and licensing functions of DoT from the service provision functions. The Government corporatized the operations wing of D.o.T. in October 2000 and it was named as Bharat Sanchar Nigam Limited which operates as a public sector undertaking (PSU). After that in 2002, the control of VSNL also came to an end.

As the Government was not capable to meet the demand of telephone connections coupled with the fact that there was a huge waiting list for telephones in India, the Government opted to call the private sector in telecom. Additionally, the Government introduced the Cellular Mobile Telephone Service license and the Basic Telecom Service license permitting private players to offer telecom services in India. The private telecom sector responded positively to this move and the Government gave 39 CMTS licenses and two Basic licenses. After that, the Government simplified the licensing policy and introduced the Unified Access Service License, combining the two licenses, i.e. Basic and CMTS thus allowing UASL to provide both services under the domain of one

license. Different new licenses issued by the Government attached with other measures undertaken to release the Indian telecom market led to an inflow of more than 12 billion dollars of foreign investment from 2000 to 2013 by different international telecom players. The Indian telecom sector story was one of large volumes and low ARPU which offered a huge opportunity for international telecom players who were undergoing saturating in the growth of their subscriber base in other parts of the world.

Due to the saturation of growth of this industry over the past years for various reasons, the D.o.T. brought the National Telecom Policy 2012 in an effort to align efforts of stakeholders, policy makers and law makers to achieve a common goal.

The preamble to the NTP 2012 reads as follows:

"Telecommunication has emerged as a key driver of economic and social development in an increasingly knowledge intensive global scenario, in which India needs to play a leadership role. National Telecom Policy-2012 is designed to ensure that India plays this role effectively and transforms the socio-economic scenario through accelerated equitable and inclusive economic growth by laying special emphasis on providing affordable and quality telecommunication services in rural and remote areas."

The mission and vision of the NTP 2012 is as follows:

- To build up a strong and secure state-of-the-art telecommunication network providing seamless coverage with special focus on rural and remote areas for linking the digital divide and thereby facilitate socio-economic development.

- To create a comprehensive knowledge society through propagation of affordable and high quality broad band across the nation.
- To relocate the mobile device as a tool of socio-economic empowerment of citizens.
- To enable India a global centre for telecommunication equipment manufacturing and a centre for effective communication services.
- To promote Research and Development, design in critical edge Information and Communications Technology and Electronics technologies, products and services for gathering the infrastructure needs of domestic and international markets with target on safety and eco friendly technologies.
- To promote development of new benchmarks to meet domestic national requirements, generation of IPRs and contribution in international standardization bodies to add in formation of global standards, thereby enabling India a leading nation in the area of telecom standardization
- To pull investment, both from outside and inside.
- To encourage creation of jobs through above.

The NTP 2012 seems to be dynamic in its current status. For example it proposes to work towards One Nation - Free Roaming allowing customers to receive free incoming calls across India without paying additional roaming charges, likewise allowing subscribers to make outgoing calls at local tariffs without paying roaming charges across India along with the introduction of the One Nation-One License policy. It is intended to ensure that India plays an effectual role to change socio-economic scenario by offering affordable

and quality telecomm services in not just urban but rural areas also. NTP-2012 finds that the rapid growth in the telecom industry requires to be assisted by an improved pace of human capital formation and capacity building. Availability of new technologies has posed new challenges in network security, communication security and communication assistance to law enforcement agencies. NTP- 2012 provides a planning framework for achieving these goals, however major concerns remain with respect to actual implementation of the NTP 2012 along with timelines for the same.

Following the introduction of the NTP 2012, the government seems to be strong-minded to bring about much needed reforms in the telecom industry. The Unified Licensing system, which has been discussed in detail, has been started in progression of the One Nation-One License policy. In the same way, FDI restrictions have been removed which earlier necessitated having a local associate for all telecom business. Although still there remains one major area that has not yet been looked, i.e. Mergers and Acquisitions. The telecom industry is quite uneven and consolidation is considered vital at this stage and to that extent the sector awaits the government's policy on Mergers and Acquisitions in the telecom industry.

1.10 Different Mobile Technologies

GSM technologies with 80-90 % market share and Code Division Multiple Access around 10-20 % market share are two most common mobile communication technologies worldwide. Both technologies have same target: to provide the fixed Radio Frequency spectrum among various users. Our country mainly follows the GSM mobile system, in the 900MHz and 1800MHz band. The 900MHz band has superior transmission capabilities, which causes lower CAPEX cost for development of coverage area, as the

number of towers and the base stations required would be smaller than in the 1800MHz band.

Time Division Multiple Accesses —underlying technology used in GSM's, does it by dividing the channel into chronological time slices. Each user of the channel takes turns to send out and receive signals. In fact, only one subscriber is actually using the channel at a specific time slot. This is equivalent to time-sharing on a large computer server.

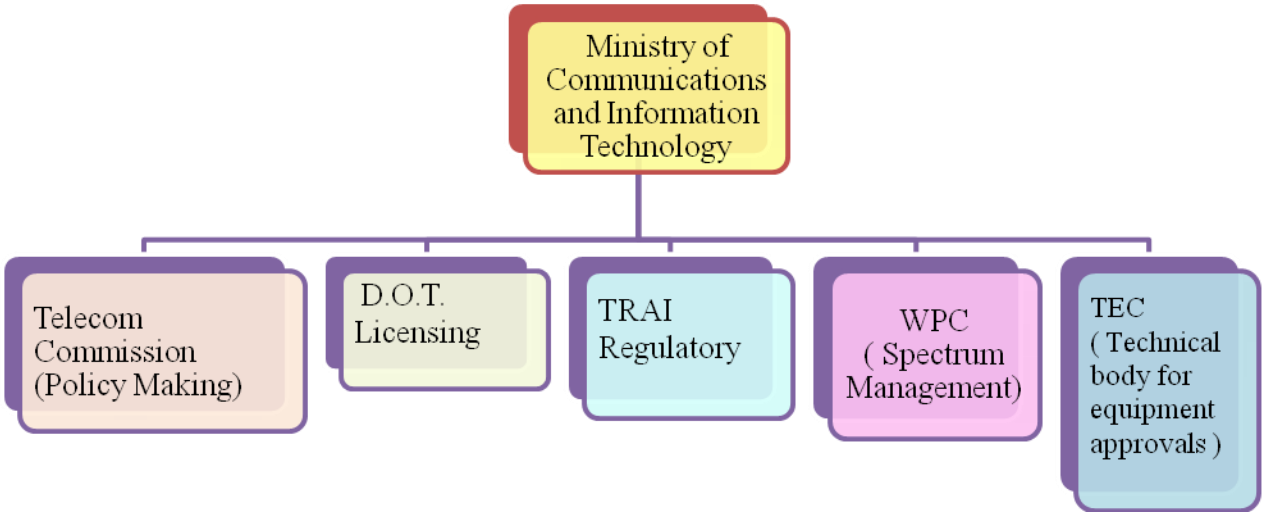
Code Division Multiple Access—This technology used in GSM's 3G and IS-95's 2G , on the other hand, uses a special type of digital modulation called spread spectrum which spreads the voice data over a very wide medium in pseudorandom style. The receiver undoes the randomization to gather the bits together and create the sound. For evaluation, imagine a party, where pairs are interacting to each other in a common room. The room shows the available bandwidth/spectrum. In GSM technique, a speaker takes turns talking to a listener. The speaker talks for a short duration and then stops to let another pair talk. There is never more than one speaker talking in the room, no one has to be anxious about two conversations overlapping. While in CDMA, any speaker can talk at any moment of time; but each uses a different language. Each listener can only understand the language of his/her partner. As more and more couples communicate, the surrounding noise gets louder, but because of the dissimilarity in languages, voices do not mix.

1.11 Indian Telecom Authorities and Architecture:

To run customer friendly, effectively and smoothly telecom services, Govt. of India established following architecture of different telecom authorities in India: **(See Fig1.1)**

Fig-1.1

Indian Telecom Authorities



Further, we will discuss some important aspects of various Indian telecom authorities in brief.

1.11.1 Telecom Commission

The Indian Telecom Commission is an inter-ministerial higher level government department. The Commission has a Chairman, four full time members, who are ex-officio, Secretary to the Government of India in the Department of Telecommunications and four part time members who are the Secretaries to the Government of India of the

concerned Departments. The crucial functions of the Telecom Commission are stated as under:

- Policy making, issuing licenses and coordinating issues related to telegraphs, telephones, wireless, data, internet/broadband services and other similar forms of communications.
- International cooperation in issues concerned with telecommunications;
- Promotion of standardization, R and D in telecommunications;
- Promotion of private investment in telecom sector;
- Making the DoT budget and managing its operations

1.11.2 Department of Telecommunications (D.o.T.)

According to the Indian Telegraph Act-1885 and the Indian Wireless Telegraphy Act-1933, the Government of India has the special privilege of deploying, maintaining and working telegraph and wireless telegraph equipment and is the power to grant licenses for such type of activities. The Government acts through the D.o.T. Few of the main functions of the DoT are as under:

- Issuing Licenses and forming regulations
- International cooperation in matters connected with telecommunications (ITU related), International Telecommunication Satellite Organization related (INTELSAT) etc;
- Promotion of private investment in the Indian telecommunications sector;
- Promotion of standardization, research and development in telecommunications.

1.11.3 Telecom Regulatory Authority of India (T.R.A.I.)

TRAI is an independent autonomous statutory body recognized under Telecom Regulatory Authority of India Act, 1997. Government ensured that there is an independent communications regulator to support liberation. TRAI acts as an independent watchdog of the telecom industry in the country. One of the major objectives of TRAI is to give a fair and crystal clear policy environment which promotes a level playing field and facilitates reasonable competition among different telecom players. TRAI's powers are recommendatory, compulsory, regulatory and legal.

The key recommendatory powers of TRAI are as below:

- Recommendations about the need and timing for introduction of new telecom service providers.
- Recommendations related to the grant of telecom licenses together with their terms and conditions.
- Recommend revocation of license for disobedience of terms and conditions of license.

TRAI is the only authority empowered to take obligatory decisions on fixation of tariffs for provision of telecom services. Importance needs to be placed on the interaction between the recommendatory powers of TRAI and the policy making powers of D.o.T. Whereas the D.o.T. is the only power for licensing of all telecom services in India, it is compulsory for the DoT to have before it TRAI's recommendations with regard to i over which issues TRAI has recommendatory powers . After accomplishing it, the DoT has the carefulness to either accept or reject the recommendations of TRAI. It has over the years come out with a number of recommendations; D.o.T. has acknowledged some such

recommendations either completely or partially or has rejected such recommendations. Following is the status of some of the recommendations prepared by TRAI to the DoT:

1.11.4 TRAI Recommendations:

Telecommunications in India can be considered back to the 19th century when the British Company (East India) delivered services in India. The last two decades have been taken as the golden period for the telecom sector in India with exponential development in terms of technology, penetration, as well as policy. All this has accomplished with the liberalization in this sector and massive investment by both domestic and FDIs

The telecomm sector has impact on each part of our lives, from the normal reality of enabling telecom communication between people in various locations to enabling supply-chains to work seamlessly across.

1.12 Telecommunication Services

In communication, a telecommunications service is a service offered by a service provider or a particular set of user-information transfer capabilities given to a group of users by a telecom system. Fundamentally there are two types of telecom services, one is data and another is voice. Voice services are delivered on very small bandwidth known narrowband. Internet/Data services are provided on broadband (wider) network. This detail of this service is given in following section:

1.13 Broadband Internet Services in India (≥ 512 Kbps download)

As per the report of World Bank, 10% growth of broadband penetration rate will force 1.4% growth of GDP. Government of India started it's an important program "Digital India" on 1st June, 15. The accomplishment of this program relies completely upon ubiquity of broadband services in India. In the scientific era of today, the

"Broadband" has become the salvation of internet users. It enables the technology and equipment for the digital delivery of voice, video and data services. It's very clear that in a small time broadband services has become a driver for all types of industries whether manufacturing or service industry. Certainly within these industries, broadband service as a market driver has reached ubiquity but not up to the last mile user. Broad band's significance is surely on the rise. It plays a drastically important role in the successful operation of business, transparent and smooth functioning of Government but also day to day life of even a common man is governed by it. The worldwide growth of e-commerce shows that people are becoming more and more dependent on the Internet for communications and all type of services.

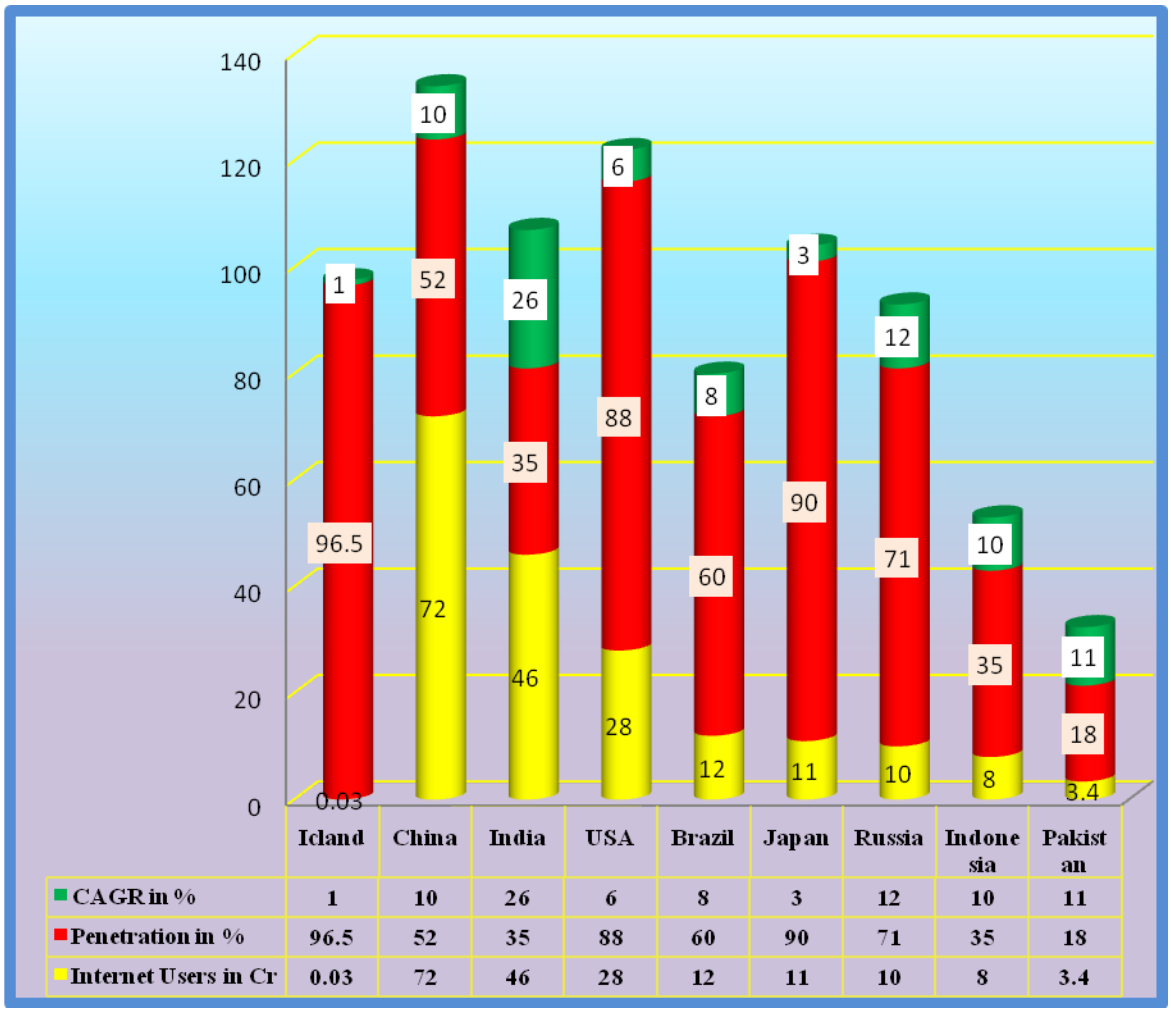
The major limitations in ubiquity are restricted availability of spectrum, higher tariff of Internet usages, unavailability of last mile broadband connectivity, unavailability of electricity, unavailability of mobile networks, less awareness about e-Services and quality of services rendered. As on 30th April 2015, the wired broadband density was only 1.33% and wireless internet users were 30 Crore.

Broadband plays a significant role in an economy and contributes considerably to the development and social progress of a country. Broadband network is considered as major infrastructure for national development. Broadband operation is the key driver for worldwide economic growth. It develops not only competitiveness and productivity but also helps the nation to eliminate the social divide and attain inclusive growth. India has seen a multi fold increase in internet users in the last couple of years; India is speedily becoming a digital nation. India has the peak yearly growth rate of 26% and currently has the third largest number of internet users worldwide but the penetration is only 35 %.

The statistics of some major countries have been represented in **Chart No.1.2.** Iceland is ranked first with 96 % penetration.

Chart 1.2

No. of Internet connections v/s Population V/s Penetration V/s One Year growth



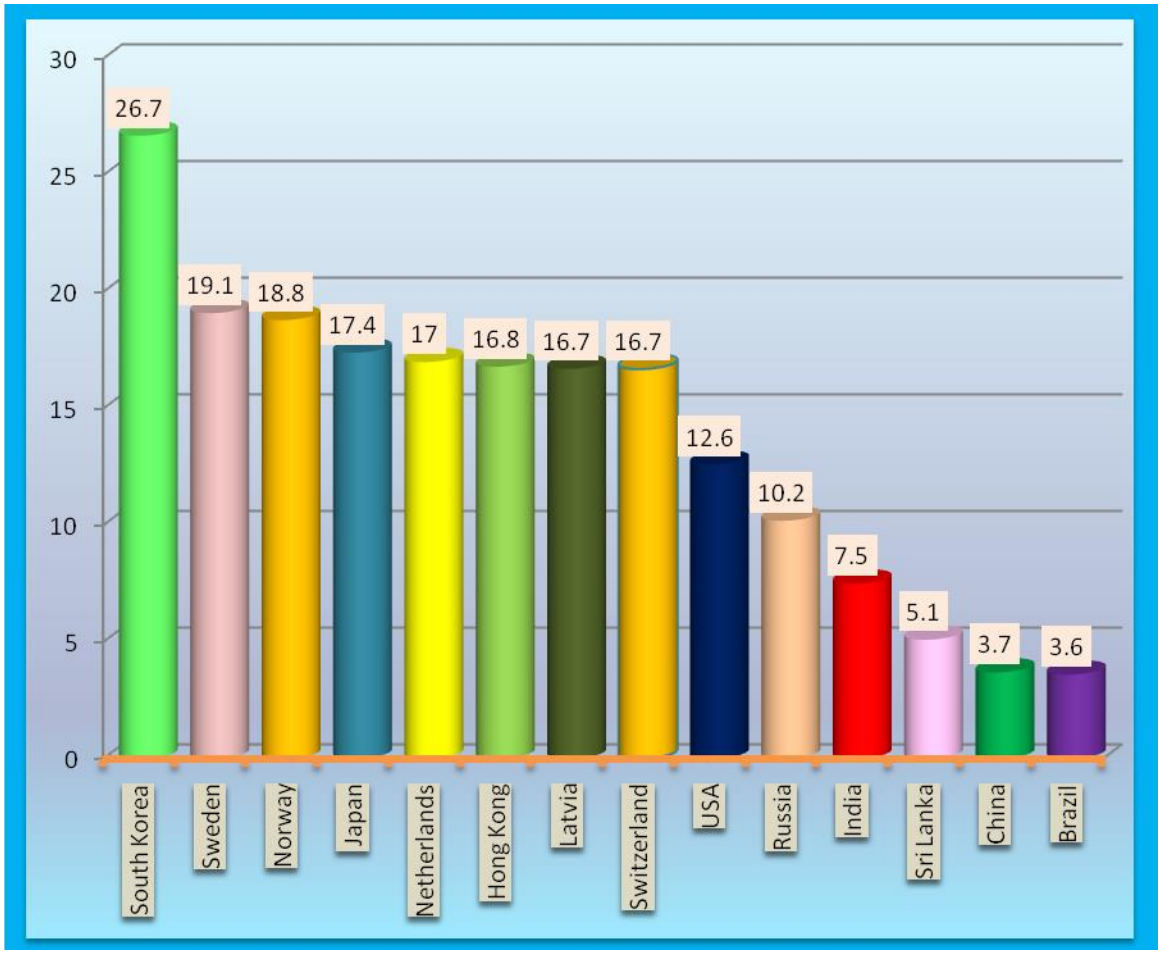
	Icland	China	India	USA	Brazil	Japan	Russia	Indonesia	Pakistan
CAGR in %	1	10	26	6	8	3	12	10	11
Penetration in %	96.5	52	35	88	60	90	71	35	18
Internet Users in Cr	0.03	72	46	28	12	11	10	8	3.4

As per the latest report of TRAI, total number of internet subscribers has reached to reach 302.35 million in March 2015. Among total internet subscribers, wired internet subscribers were 19.07 million (which registered yoy growth of 2.9%) and wireless internet subscribers were calculated 283.29 million (which registered yoy growth 12.77%). It is apparent that mostly smart phone penetration is

raising the internet usage across the country and internet usage on mobile devices has already exceeded Personal Computer usage. Inexpensive and faster mobile networks, a rise in the number of users of these networks and more affordable 3G and 4G handsets will help to augment mobile data traffic. It is the true fact that the major driver of data growth on a worldwide scale in mobile apps with billions of devices to be connected each other and the online retail and online healthcare spending expected to grow at a higher rate. Internet penetration in India is not only limited to urban areas, approx 35% of internet subscribers are from rural India also. Wireless internet subscribers were 200.49 million at the end of October 2016. Wire line subscribers were 17.93 million (Total 200.49 millions). As per a study by Department of Electronics and Information Technology, the Internet of Things (I.o.T.) industry in India is expected to be a $15 billion market by 2020 and it is expected that India would have a share of 5-6% of the global I.o.T. industry.

The biggest growth will be observed in e-Commerce, which is going to expand almost 5-fold, whereas education and healthcare through mobile internet will increase internet use. Internet growth would certainly inspire entrepreneurship and wealth creation due to the enormous potential of untapped Indian market. Up till now, more than 110 countries have declared their broadband plan. Majority of the developed counties have setup 100 Mbps as their broadband speed target for 2020. The current status of broadband speed in India compared with other major countries is graphically shown in Chart No-1.3:

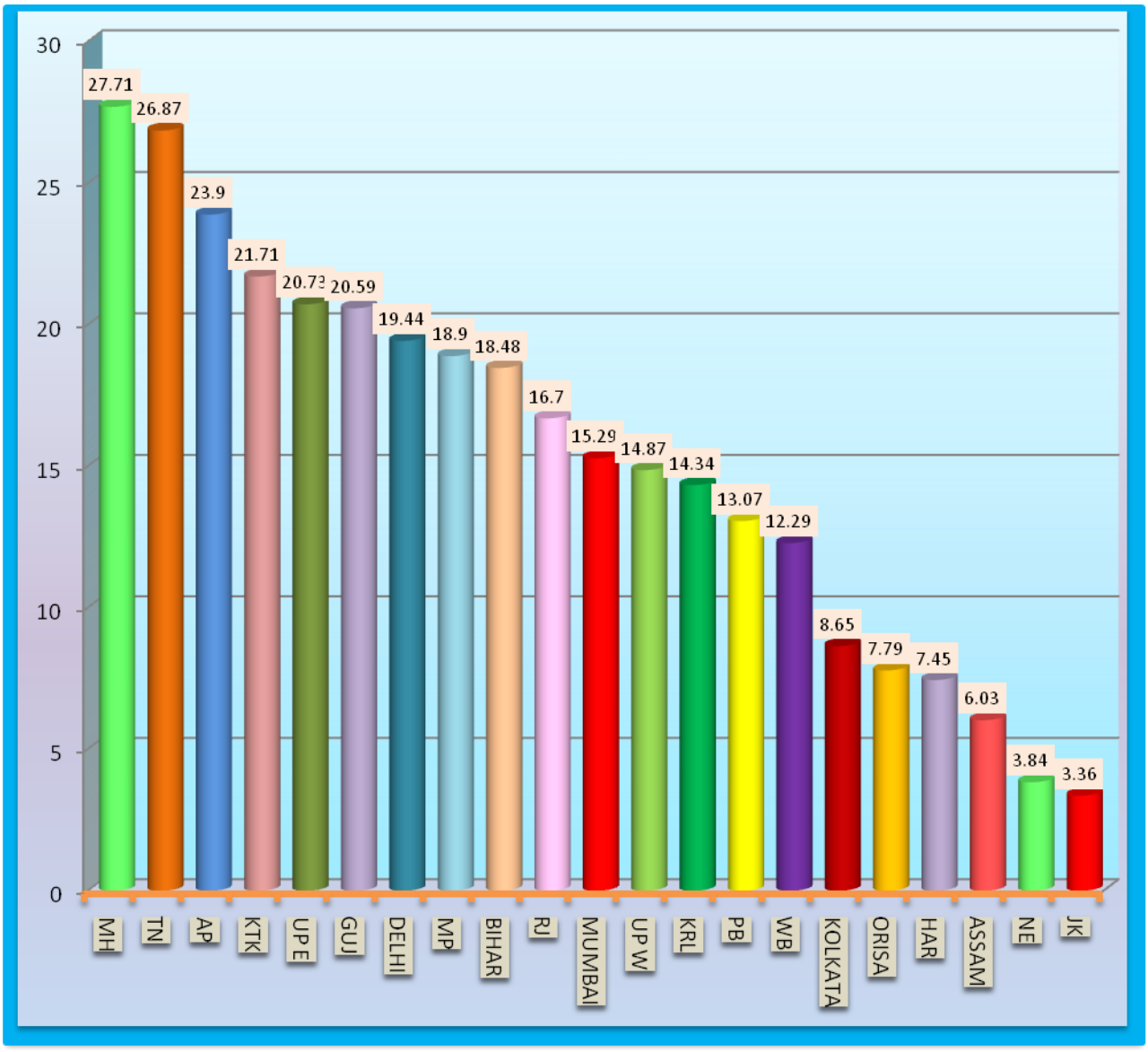
Chart No-1.3 Comparison of Avg. Speed (in Mbps) of Major Countries



(Source https://www.fastmetrics.com/internet-connection-speed-by-country.php)

It is very obvious from above graph that internet speed in India is only 7.5 Mbps while the South Korea is at first position with speed of 26.7 Mbps. If we further analyze the data in India with respect to number of users, Maharashtra is at No.1 position with 27.71 million and Himachal Pradesh at last position with 2.84 million users. The state wise number of broadband connections are graphically represented in **Chart No-1.4**

Chart No-1.4 State-wise Broadband Connections in Million as on March, 16



(Source www.medianama.com)

This status is not satisfactory at all. India formulated its first broadband plan in 2004. Further India launched its broadband plan 2012, in which vision up to 2020 has been considered. To attain the targets, Bharat Broadband Network Limited (BBNL) has been formed.

1.13.1 Broadband Service

A high-speed Internet access is normally called "Broadband". The D.o.T. (Department of Telecom) has revised the definition of Broadband through its notification dated 18.07.2013. The revised definition of Broadband is as follows:

"Broadband is a data connection that is able to support interactive services including Internet access and has the capability of the minimum download speed of 512 kbps to an individual subscriber from the point of presence (POP) of the service provider intending to provide Broadband service."

Speed is one of the major factors which draw potential users to become Broadband subscribers. Speed must be above a definite threshold point to make sure use of preferred application such as video streaming/viewing or gaming. As broadband services have become faster and wider spread, website developers have taken the advantage of the added bandwidth to offer more affluent and more composite websites. A range of tariff plans with various speeds provides better choice to users.

Higher communication speeds are pertinent in knowledge based sector. It is because, spurs of productivity and therefore increases competitiveness, which gives countries GDP the ability to rise. Improved broadband speed leads to grow economy hence more jobs. The major reason is the building of new infrastructure. In the long span, there are indirect effects that create new jobs, triggered by improved innovation resulting in new services.

The following **Table1.6** shows the definition of Broadband as prescribed by regulators in different countries:

Table 1.6 Definition of Broadband

Country	Definition of Broadband
USA	The federal Communications commission has modified the definition of broadband services, from the previous definition of 4 Mbps down and 1 Mbps up to new standard of 25Mbps down and 3 Mbps up in Jan, 15.
Brazil	At least 1 Mbps download speed
Canada	The Canadian national Broadband Task Force decided not to define broadband speed in terms of information transmission rate, but defined it as "a high capacity, two way link between end users and access network suppliers able of supporting complete motion interactive video applications to all Canadians on terms comparable to those available in urban market." Based on the technology existing at the time. It accomplished that at least symmetrical transmission speed of 1.5 Mbps per individual user was necessary to meet this standard.
Bangladesh	In a proposal to ensure faster internet services to subscribers the Bangladesh Telecommunication Authority Commission changed the definition of Broadband in April, 13th. As on date internet service over 1 Mbps is called Broadband and below 1 Mbps is called narrowband.

A number of countries have focused on setting determined minimum speed goals. Broadband speed goals in some of these countries include:

- Australia's objective is to make connections with speeds of 100 Mbps available to 93 % of institutions, homes, schools and businesses by 2018
- Finland has aim of delivering speeds of 100 Mbps to all of offices, homes, schools

and businesses by 2016 .

- Germany's target is provide speeds of 50 Mbps per Connection for 75% of institutions/households/offices.
- The European Union "Digital Agenda for Europe" calls for all Europeans to have access to connections with speed of minimum 30 Mbps by 2020 with 50% or more offices/households having access to speed in excess of 100 Mbps.
- In Korea, which is a country where broadband connection speed already almost 50 Mbps, has set the haughty aim of 1 Gbps per connection.
- Sweden targets for 40% of institutions/households and business having access to 100 Mbps by 2015 and 90% by 2020.

According to ITU's "Working together to connect to world by 2020" paper released during the World Economic Forum Summit 2016, "Relied upon a significant body of research on the economic impact of broadband, it is normally accepted that broadband has its beneficial impact on economic development. Furthermore some research shows that broadband speed matters." The paper goes on to quote various studies which enables to know that 10 % increase in Broadband penetration is probable to have a positive impact, and could move up economic development in between 0.25% to 1.4%. If broadband speed is twofold, GDP may boost, potentially by up to 0.3%.

National Telecom Policy-2012 has the idea **"Broadband on Demand"** and ensures leveraging telecom infrastructure to enable all customers and businesses, both in urban and rural areas, to take part in the Internet and web economy thereby ensuring impartial and inclusive development across the nation. It provides the enabling framework for rising India's competitiveness in all spheres of the economy.

NTP-2012 Target:

To provide affordable and reliable broadband-on-demand by the year 2015 and to achieve 175 million broadband connections by the year 2017 and 600 million by the year 2020 at minimum 2 Mbps download speed and making available higher speeds of at least 100 Mbps on demand. Provide high speed and high quality broadband access to all village "Panchayats" through a combination of technologies by the year 2014 and progressively to all villages and habitations by 2020." Further, Point 1.5 of part IV strategies contained in the National Telecom Policy-2012 states that:

"To revise the existing broadband download speed of 256 Kbps to 512 Kbps and subsequently to 2 Mbps by 2015 and higher speeds of at least 100 Mbps thereafter."

Most of the wired broadband connections are provided in India on DSL (Digital Subscriber Line) technology is taken the most available technology, which is broadly used by leader in delivering broadband services BSNL. Business Institutional and high end users prefer for Internet Leased line services due to uninterrupted and high quality of services. Dedicated bandwidth is delivered in ILL services but tariffs are very high with compared to general broadband plans. Conversely, wireless broadband access is a ordinary element in service-providers' plans, subscriber have not yet come to terms with wireless as a broadband choice. To know broadband usage may facilitate to explain some of these limitations. Expansion in small business markets, remotely located offices and telecommuting are playing a critical role in boosting broadband demand. The outcome is that the line between institutional needs and customer connectivity is blurring—and broadband is considering both requirements. Broadband technologies are increasingly important to the success of businesses of all sizes. Fundamental trends in the business

market, including development of small businesses, telecommuters and remotely located offices, are increasing the demand for broadband and inducing a link between broadband access in the home as well as in the office. As broadband requirement changes into real customers and as businesses put together broadband into their business processes, the business group of people will speed up its progression to broadband ubiquity.

Status of Telecommunication Services in India:

As shown in **Table-1.7**, total number of telephone and mobile connections has cross the mark of one billion as on 31st March, 17. Out of these 1.19 billion connections, 1170.68 million connections are based on mobile technology while 24.38 million connections are working on wired line technique. The Tele-density has reached to 91 %.

Table 1.7 Telecom Subscription Data as on 31st March, 2017 (in millions)

Particulars	Wireless	Wire line	Total (Wireless + Wire line)
Total Telephone Subscribers (Million)	1170.68	24.38	1195.06
Tele density	91		
Broadband Subscribers (Million)	200.49	17.93	218.42

1.13.2 Internet Service Providers in India:

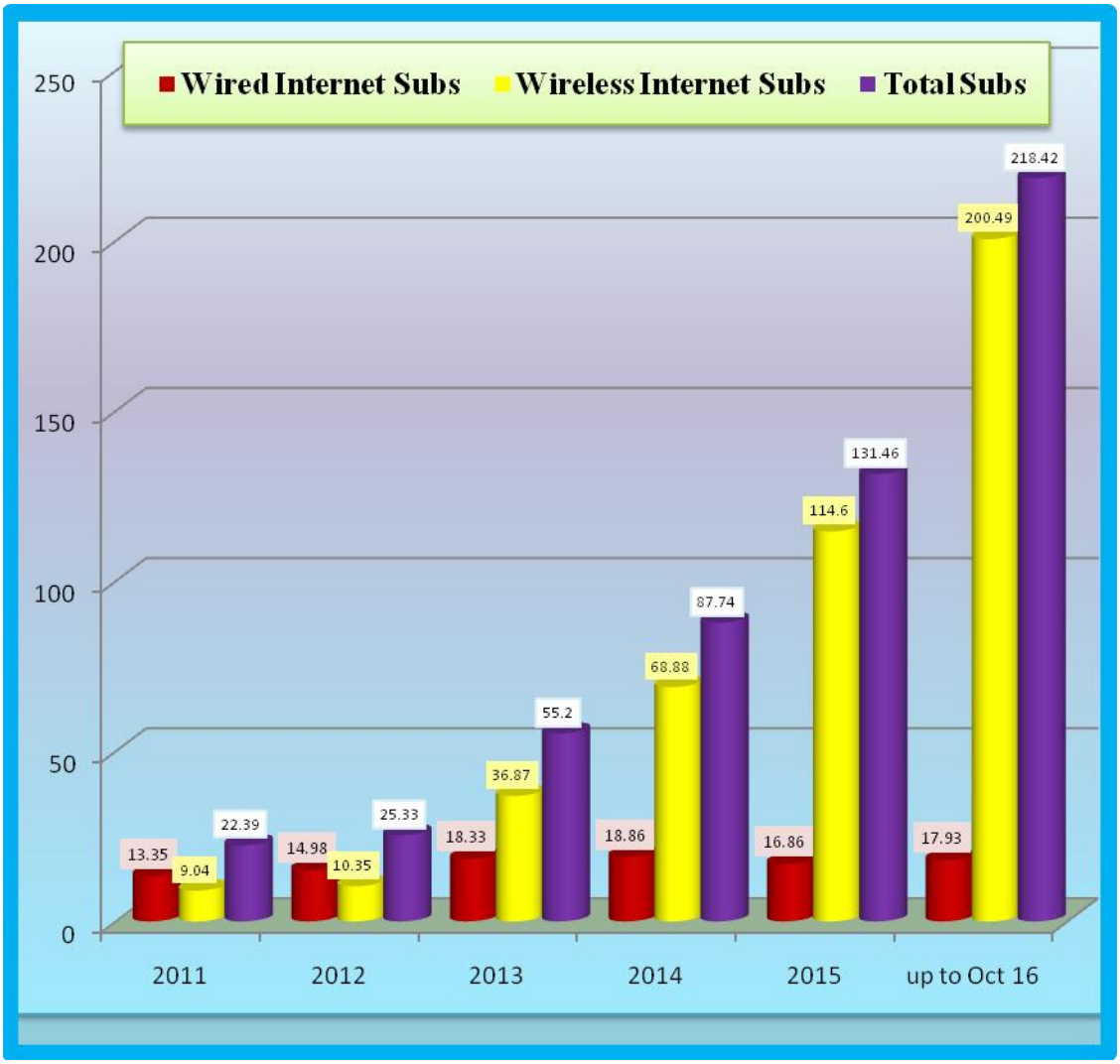
Internet Service Providers (ISPs), Unified and Cellular Mobile Service Providers (CMSPs), Access Service Licensees (UASLs) are allowed to provide broadband services under the present licensing framework. Up to 31.05.15, there are 102.49 million Subscribers have been reported by 121 operators. The growth of broadband connections in India, since 2011 has been shown in

Table-1.8 with graphical representation in below **Chart No.-1.5**

Table-1.8 Growth of broadband connections in India (in millions)

Year	Wired Internet Subs	Wireless Internet Subs	Total Subs
2011	13.35	9.04	22.39
2012	14.98	10.35	25.33
2013	18.33	36.87	55.2
2014	18.86	68.88	87.74
2015	16.86	114.6	131.46
Up to Oct 16	17.93	200.49	218.42

Chart 1.5 Year-wise Broadband Connections in India (in millions)



(Source www.trai.gov.in)

However, the top ten service providers account for about 97% of subscriber base and the top five service providers alone hold 83% market share. State owned companies BSNL and MTNL both have about 74.9% market share for wired line broadband and 30.5% for overall broadband subscriptions. This enables that even though having a license for providing broadband services, the majority of the service providers

are unable to penetrate and capture the market and the market is still conquered by a few players only. The broadband service providers in India are given in **Table-1.9:**

Table-1.9 List of Broadband Service Providers in India

SN	ISP	SN	ISP
1	Skydoot Communications GJ	9	Railtel
2	Excell Media	10	STPI
3	Tata Communications	11	Powertel
4	Bharti Airtel	12	Tikona Digital Networks
5	Bharat Sanchar Nigam	13	Tulip Telecom
6	Reliance Communications	14	Uclix Infr Ltd
7	Vodafone India	15	Acws Global - Internet Services
8	GAILTEL	16	Delta UPS- UPS Service Provider Ezycare

Broadband Market share of various operators in India

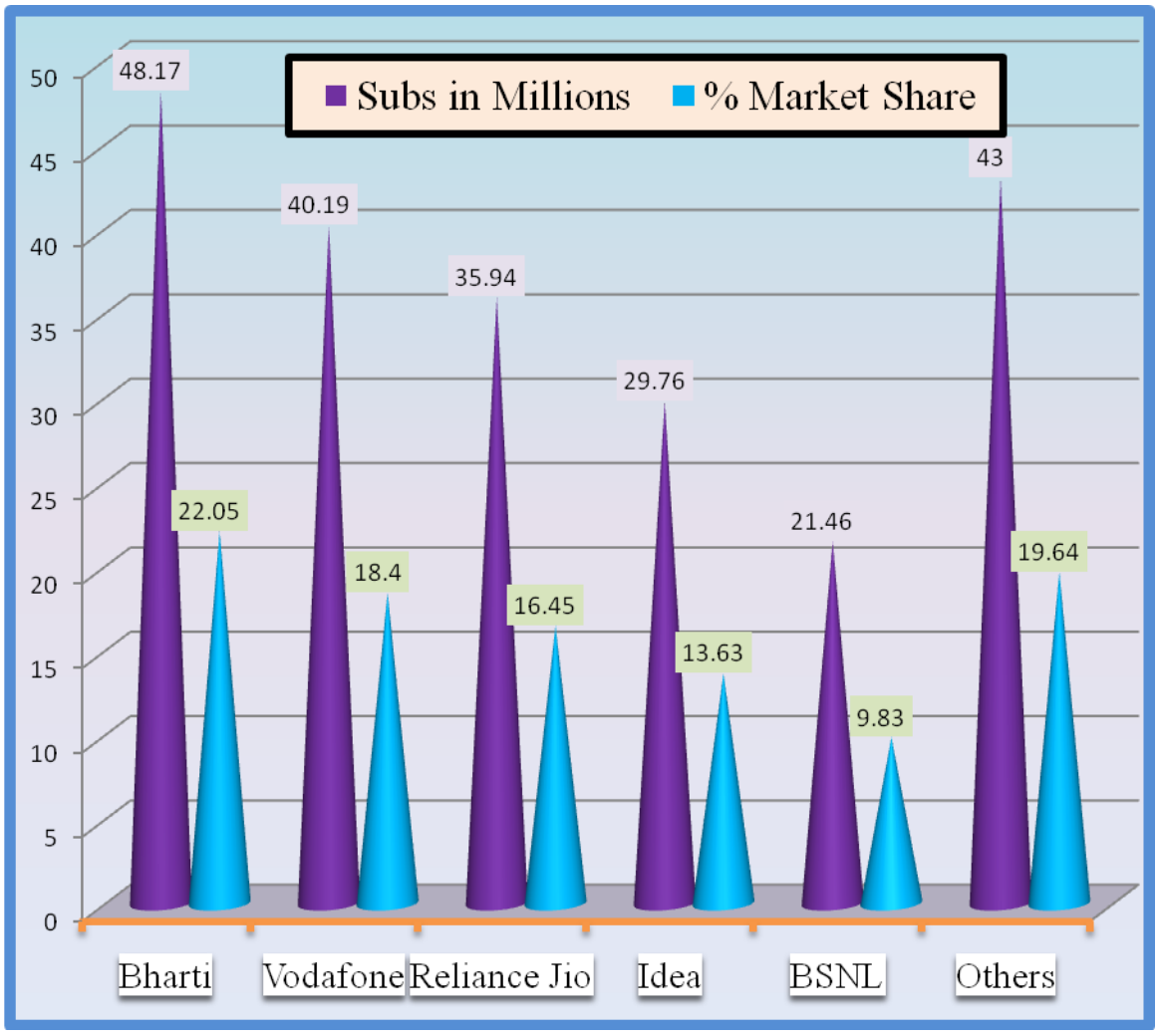
Top five service providers cater 80.36% market share of the total broadband subscribers by the end of Oct-16. These service providers were Airtel (48.17 million), Vodafone (40.19 million), Reliance Jio-Infocom Ltd (35.94 million), Idea (29.76 million) and BSNL (21.46 million).

Top ten service providers captured 88.08% market share of total wireless broadband subscribers at the end of Mar-15. The detail is given in Table 1.10 and the graphical representation is shown in Chart-1.6

Table 1.10 Broadband Market shares of various operators in India as on 30.10.16

ISP	Subs in Millions	% Market Share
Bharti	48.17	22.05
Vodafone	40.19	18.4
Reliance Jio	35.94	16.45
Idea	29.76	13.63
BSNL	21.46	9.83
Others	43	19.64
Total	**218.52**	**100**

Chart 1.6 Broadband Market shares of various operators in India as on 30.10.16 (in %)



Foreign Participation

India has welcomed into its telecom sector to FDI up to 100 percent holding in manufacturing of internet services, telecom equipment and infrastructure providers , 74 % in radio-paging services, internet and 49 % in NLD , basic telephone, cellular mobile, and other VAS . Since beginning of 1991, FDI in the telecom sector is second only to power sector and oil - 858 FDI proposals were received during 1991-2002 adding Rs.

56,279 Cr (DoT Annual Report, 2002). Foreign investors have been vigorous participants in telecom reforms even though there was some frustration due to initial dithering by the government. Up till now, most of the foreign direct investment has come in the mobile sector in part due to the fact that there have been more cellular operators than fixed service operators. For example, during 1991-2001, about 44 % of the foreign direct investment was in cellular mobile and about 8 % in basic service segment. This total foreign direct investment includes the categories of consultancy, manufacturing and holding companies.

Tariff-Formation

A vital ingredient of the transition from a secluded market to competition is the setting of tariffs to cost-recovery prices. In basic telecom, pricing of the kind that suitable in India before reforms, led to a superior degree of cross-subsidization and offered incompetent decision-making by both subscribers and telecom service-providers. Conventionally, D.o.T. tariffs subsidized the costs of access (shown in form of rental charges) with domestic and ILD usage charges. As a result, re-setting of tariffs - falling tariffs that are above costs and increasing those below costs - was a necessary pre-condition to developing competition among various service providers and competence in general. TRAI issued its first instruction concerning tariff-designing in line of NTP 1999 aimed at re-balancing tariffs and to user in an area of aggressive service provision. Afterward, it carried out timely reviews and made changes in the tariff levels, if essential. Re-balancing led to a decline in cross-subsidization in the fixed service telecom sector. Cost based pricing, a major exit from the pre-reform scenario, also enables a basis for making subsidies more crystal clear and better targeted to specific social concern.

Service Quality:

One of the major reasons for entertaining private participation in the stipulation of infrastructure rests on its ability to offer superior quality of service. In India, low Tele-density caused in great importance being laid on rapid expansion frequently at the cost of quality of service. One of the benefits predictable from the private sector's entry into telecom is a development in the quality of service to international standards. Armed with technical and financial resources, and better incentive to make profits, private telecom operators are anticipated to provide consumers value for their money (i.e. Perceived Value).

Pre Reform Period and Telecommunication in India

Prior to 1990's Telecom services in India were under complete Monopoly of government i.e. Department of Telecommunication. Government also kept the rights for manufacturing of Telecom equipments. MTNL and VSNL were formed in the year 1986. In early 1990's initial attempts started to attract private investment. Telecom equipment manufacturing was made free from licensing in 1991.A prominent rebellion has occurred in the telecommunication sector. In the pre-reforms era, this was completely in the hands of the central administration and due to lack of competition; the call tariffs were quite high. Additionally, due to lack of resources with the government, it could never meet the demand for telephones. Actually, a subscriber seeking a telephone connection had to wait for long period before he could get a landline connection. The service delivered by the government department was also very poor. Wrong/Excess billing, telephones lying dead for many days constantly due to laziness on the part of the telecom staff to attend to subscriber complaints, cross talk due to faulty underground cables, old instruments and

equipments in the telephone department were the order of the day in the pre reforms era. Now a day, there are lots of players in the telecom sector. The final beneficiary has been the customer. Prices of services in telecom sector have reduced considerably. Telephone connections are now a day's reasonably priced to everyone and are also effortlessly available. Gone are the days, when one had to wait for long period to get a telephone connection. The numbers of telephone connection which were only 2.15 million (landlines) in 1981 boosted to 5.07 million (landlines) in 1991. As in 2003, there were 54.62 million telephone connections of which 41.33 million were landline telephone connections, 12.69 million are cellular mobiles and the remaining 0.60 million were WLL telephones as in 2003. Wireless in Local Loop telephones and cellular mobile telephones were unidentified in India a few years ago. Cellular phones charges have come down drastically that today one can see even a common man roaming around with a mobile phone in his hand. The private operators are giving various schemes to attract customers, a condition which is entirely conflicting to the conditions prevailing in the pre reforms era when one had to stay for years together to get a telephone connection. The gateway toward deregulation and beginning of liberalization and private sector contribution was the declaration of National Telecom Policy 1994. In which, for the first time, private/foreign firms allowed to enter the basic and the new cellular mobile section. Foreign Direct Investment up to 49% of total equity was also all allocated in these sectors. The guidelines allowed one private service provider to compete in basic services with the present DoT in each DoT internal circle. It permitted duopoly in cellular mobile telecom services in each circle/state. As part of the completion of the NTP 94, licenses were given license fees through a tendering process. This policy started the setting up of

a self-governing regulator–the Telecom Regulatory Authority of India, which was recognized in 1997. The main object of TRAI is to provide an effective legal framework to make certain fair competition while, at the same time, defend the interest of the consumers.

1.14 Liberalization and Reforms in Telecom Sector Since early 1990's

The telecommunications sector is governed by the telegraph act of 1885. Under this act, the government is in control of policy framing and provision of telecom services. Key changes in telecom sector in India began in the 1980s. Under the 7^{th} plan (1985-90), 3.6 % of total outlay was set aside for communications and since 1991, above 5.5 % is used up on it. The initial phase of telecom reforms began in 1984 with the creation of Centre for Department of Telematics for developing original technologies and private manufacturing of customer premise equipment (CPEs). Later on, the Mahanagar Telephone Nigam Limited and Videsh Sanchar Nigam Limited were set up in 1986. The Telecom Commission was established in 1989. The growth of telecom sector has been presented in sequential order.

1991-92:

- On 24th July 1991, Government declared the New Economic Policy.
- Telecom Manufacturing Equipment license was de-regulated in 1991.
- Automatic foreign collaboration was allowed with 51 % equity by the collaborator.

1992-93:

VAS sector was opened for private and foreign operators on franchise or license basis.

These included mobile phones, voice mail, radio paging, electronic mail audio text services, video text services, data services using VSATs, and video conferencing.

1994-95:

The Government declared a NTP- 1994 in September 1994. It opened basic telecom services to private participation including foreign investments.

- Foreign equity participation up to 49 % was permitted in basic telecom services, radio paging and cellular mobile. For value added services the foreign equity cap was fixed at 51 %.
- Eight cellular licenses for four metros cities were finalized.

1996-97:

- TRAI was established as an independent body to separate the regulatory functions from policy formulations and operational functions.
- Coverage of the term "infrastructure" prolonged to include telecom sector to enable the sector to avail of financial incentives such as tax benefits and concessional duties.
- An contract between Department of Telecommunication and financial institutions to make easy funding of cellular and basic telecom projects.
- External Commercial Borrowing limits on telecom projects was made flexible with an enhanced share from 35% to 50% of total project cost.
- Internet Policy was formed

1998-99:

Foreign Direct Investment up to 49 % of total equity, subject to license, allowed in

companies providing Global Mobile Personal Communication through satellite services.

1999-2000 :

- NTP- 1999 was declared which allowed multiple fixed Services operators and
- opened LD services to private operators.
- TRAI was reconstituted: clear difference was made between the recommendatory
- and legal functions of the Authority.
- MTNL/DOT was allowed to start cellular mobile telephone service (CMTS).
- To distinguish service providing functions from policy and licensing functions,
- D.o.T. Services was set up.
- A package was offered for migration from fixed license fee to revenue sharing to exist cellular and basic service providers.
- First phase of re-balancing of tariff structure initiated. STD and ISD charges were cut by 23% on an standard rates
- Voice and data sector was opened to full competition and foreign ownership

FDI increased to 100 per cent from 49 per cent previously.

2000-01:

- TRAI Act was changed. The Amendment clarified and strengthened the recommendatory power of TRAI, particularly with respect to the need and timing of offer of new services provider, and in terms of licenses to a services provider.
- Department of Telecom Services and Department of Telecom operations merged by creating Bharat Sanchar Nigam Limited.
- Domestic long distance services opened up without any constraint on the number of operators.

- Second phase of tariff change started with further reductions in the long distance STD rates by an average of 13% for different distance slabs and ISD rates by 17%.
- ISPs were given authorization for setting up of International Gateways for Internet using satellite as a medium in March 2000.
- In August 2000, private operators were allowed to set up international gateways via the submarine cable route.
- The extinction of monopoly of VSNL in ILD services was antedated to 31st March, 2002 from 31st March, 2004.

2001-02:

- Communication Convergence Bill-2001 was brought in August 2001.
- Competition was started in all services segments. TRAI suggested opening up of market to complete competition and beginning of new services in the telecom sector. The licensing terms and conditions for CMTS were made easy to encourage entry for operators in areas without efficient competition.
- Usage of VoIP permitted for international telephony service.
- The five-year tax holiday and 30% reduction for the next five years available to the telecommunication sector till 31st March 2000 was again introduced for the units commencing their operations on or before 31st March 2003. These concessions were also given to ISPs and broadband networks.
- Thirteen ISP's were given permission for commissioning of international gateways for Internet using satellite medium
- License conditions for Global Mobile Personal Communications by Satellite approved in November 2001.

- NLD Service was opened up for clear entry with the announcement of guidelines for licensing NLD operators. Four companies were given Letter of Intent (LOI) for NLD Service of which three licenses have been signed.
- The basic service was also offered for competition. 33 Basic Service licenses were issued
- Four cellular operators, one each in four metros city and thirteen were permitted with 17 fresh licenses issued to private operators in October 2001. The mobile providers were given liberty to provide, within their area of operation, all types of mobile services equipment, including circuit / package switches that meet the applicable International Telecommunication Union standards.
- Wireless in Local Loop was brought for providing telephone connection in urban and rural areas.
- Disinvestment of PSU's in the telecom sector was also started during the year. In Feb 2002, the disinvestment of VSNL was completed by bringing down the government equity to 26% and the management of the company was given to Tata Group, during the year, Hindustan teleprompters was also disinvested.
- Government allowed CDMA technology to enter the Indian telecom market.
- Reliance, MTNL and Tata were given licenses to provide the CDMA technology based services in the country.
- TRAI suggested deregulating regulatory intervention in cellular tariffs, which showed that operators need no longer have pre-approval of the regulator for implementing tariff plans.

2002-03;

- ILD business opened for unrestricted entry.
- Telephony on internet allowed in April 2002.
- TRAI completed the System of Accounting Separation (SAS) providing detailed accounting and financial system to be maintained by telecom operators.

2003-04;

- Unified Access Service Licenses (UASL) policy for basic and cellular services was started in October 2003. This policy enabled services providers to offer fixed and mobile services using single license. As a result 27 licenses out of 31 licenses renewed to UASL.
- IUC-Interconnection Usage Charge policy was introduced with the view of providing termination charge for cellular services and allow introduction of Calling Party Pays policy in voice telephony segment.
- The Telecommunication IUC Regulation 2003 was brought in on 29th October 2003 which covered planning among service providers for payment of IUC for Telecommunication Services and covered Basic Service that includes WLL services, CMTS , and Long Distance Services throughout the territory of India.
- The USO fund was introduced as a instrument for transparent cross subsidization of universal access in telecom segment. The fund was to be collected through a 5% levy on the AGR of all telecom operators.

Broadcasting notified as Telecommunication services under Section 2(I) (k) of TRAI Act.

2004-05:

- In the Budget 2004-05 proposed to remove the ceiling from the existing 49 % to 74% as an incentive to the cellular operators to fall in line with the new unified licensing norm.
- 'Last Mile' connectivity permitted in April 2004 within the local area for ISP's for creating their own last mile to their customers.
- Indoor use of less power equipments in 2.4 GHz band de-licensed from August 2004.
- Broadband regime announced on 14th October 2004. In this regime, broadband had been defined as an "always-on" data connection supporting interactive services including internet access with a minimum download speed of 256 kbps per subscriber.
- The Telecommunications Interconnection Regulation 2004 was brought into effect on 10th December 2004.
- BSNL and MTNL started broadband services on 14th January 2005.
- TRAI declared the reduction of Access Deficit Charge by 41% on ISD calls and by 61 % on STD calls which were applicable from 1st February 2005.
- **2005-2006;**
- In the Budget 2005-2006 declared a hike in FDI ceiling to 74% from the earlier limit of 49%. Further 100% FDI was permitted in the area of telecom equipment manufacturing and provision of IT enabled services.
- Annual license fee for National Long Distance as well as International Long Distance licenses decreased to 6% of Adjusted Gross Revenue with effect from 1st

January, 2006.

- BSNL and MTNL started the 'One-India Plan' with effect from 1st March 2006 which ensure the customers of BSNL and MTNL to call from any part of India to any part @ the cost of Rs. 1 per minute, any time of the day over phone.
- TRAI fixed Ceiling Tariff for International Bandwidth, Ceiling Tariff for higher capacities declined by about 70% and for lower capacity by 35 %
- Regulation on QoS of Basic and Cellular Mobile Telephone Services 2005 introduced on 1st July 2005.
- BSNL declared 33 % reduction in call charges for all the countries for international calling.
- Code of Practice for Metering and Billing Accuracy Regulation 2006 introduced on 21st March 2006.
- **2006-2010**
- The per minute ADC for domestic calls changed with a revenue share fee of 1.5% of non- rural AGR, coupled with a pointed 60% drop in per minute ADC on international calls.
- ADC on % revenue share reduced to 0 .75% from 1.5% of AGR.
- Per minute ADC on outgoing international calls lowered to zero, and on incoming international calls lowered to Rs.1, Roaming rental brought to zero.
- Reduction of roaming tariffs to the extent of 22 % -56 %, Port charges reduced by 23%-29 %

2010-2015

- Offerings by telecom regulator TRAI on spectrum sharing.

- BSNL started “all India roaming” free scheme.
- BSNL started “Night free calling” from land line during 9 pm to 7 am.

2016-2017

The government’s grand Rs 7,000-crore ‘Smart City’ program is of vital importance in some other areas likely to have a vast impact on the telecom sector in the times to come as well as present new revenue opportunities for Service Providers. In 2016, operators and over-the-top content providers are predictably to invest heavily in city- wide Wi-Fi networks which will be the spine for smart city services. M2M will also have a key role to play in smart cities. According to Deollite Research Indian M2M opportunity is probably to reach 100 million USD by 2016 as ecosystem is quick evolving. With propagation of 3G and 4G services, exponential expansion for M2M transactions is expected in 2016-17.

1.15 An overview of Indian Telecom Service Providers

The telecommunications industry is continuing to change at breakneck speed. Faced with ongoing disruption from every side, operators have recognized — and are taking advantage of — their pivotal enabling role in a digital society. Mounting pressure on the bottom line means the emphasis is still on driving efficiencies into the business, yet many operators are also exploring new opportunities in a rapidly widening digital ecosystem as they look to meet a new wave of customer demands. Operators are well placed to act as catalysts of transformation in a fast-changing digital society. But before they can take advantage of changing customer and industry stakeholder expectations, they must decide where they want to play — and then focus rigorously on developing the strategies, technologies and talent that will be prerequisites for success in that area. The alternative

is to be sidelined as a “jack of all trades, but master of none” at a time when strategic vision and the ability to execute have never been more important.

Indian telecom market consists of both government and private operators. Initially there were only two government players i.e. Department of Telecommunication and MTNL, but after liberalization government opened this field for private players also.

1.15.1 Government Telecom Operators:

Presently only two players with 100 % government stake are operating. MTNL is operating in two metros New Delhi and Mumbai, while BSNL is providing telecom services on Pan India basis except these two metros.

1.15.1.1 *Bharat Sanchar Nigam Limited (BSNL)*

Bharat Sanchar Nigam Ltd. was incorporated on 15th September 2000. It took over the business of providing of telecom services and network management from the erstwhile Central Government Departments of Telecom Services (DTS) and Departments of Telecom Operations (DTO), with effect from 1st October, 2000 on going concern basis. It is one of the largest & leading public sector units providing comprehensive range of telecom services in India.

BSNL has installed Quality Telecom Network in the country & now focusing on improving it, expanding the network, introducing new telecom services with ICT applications in villages & winning customer's confidence. As on 31.03.2017, it has about 36.42 million line basic telephone capacity, 7.13 million WLL capacity, 95.96 million GSM capacity, 34,727 fixed exchanges, 1,17,090 GSM BTSs, 9594 CDMA Towers, 102 Satellite Stations, 7,73,976 R.Km. of OFC, 4751 R.Km. of microwave network connecting 646 districts, 4519cities/towns & 6.25 Lakhs villages .

BSNL is the only service provider, making focused efforts & planned initiatives to bridge the rural-urban digital divide in ICT sector. In fact there is no telecom operator in the country to beat its reach with its wide network giving services in every nook & corner of the country & operates across India except New Delhi & Mumbai. Whether it is inaccessible areas of Siachen glacier or North-Eastern regions of the country, BSNL serves its customers with a wide bouquet of telecom services namely Wire line, CDMA mobile, GSM mobile, Internet, Broadband, Carrier service, MPLS-VPN, VSAT, VoIP, IN Services, FTTH, etc.

BSNL is one of major service provider in its license area. The company offers wide ranging & most transparent tariff schemes designed to suit every customer. BSNL has 94.36 million cellular & 1.02 million WLL customers as on 31.10.2016. 3G Facility has been given to all 2G connections of BSNL. In basic services, BSNL is miles ahead of its rivals, with 13.88 million wire line phone subscribers i.e. 56.96% share of the wire line subscriber base.

BSNL has set up a world class multi-protocol convergent IP infrastructure that delivers convergent services such as voice, data & video through the same Backbone & Broadband AN. Presently there are 32 million broadband customers.

The BSNL has vast experience in planning, installation & maintenance of switching & transmission networks & also has various world class ISO 9000 certified Telecom Training Institute. During the 2015-16, turnover of BSNL was approx. Rs. 32,919 Crores.

VISSION:

- Be the leading telecom service provider in India with global presence.
- Create a customer focused organization with excellence in customer care, sales and marketing.
- Leverage technology to provide affordable and innovative telecom. Services/ Products across customer segments.

MISSION:

- Be the leading telecom service provider in India with global presence.
- Generating value for all stakeholders - employees, shareholders, vendors & business associates
- Maximizing return on existing assets with sustained focus on profitability
- Becoming the most trusted, preferred and admired telecom brand to explore International markets for Global presence
- Creating a customer focused organization with excellence in customer care, sales & marketing.
- Developing a marketing and sales culture that is responsive to customer needs customer care, sales& marketing
- Excellence in customer service-"friendly, reliable, time bound, convenient and
- courteous service"
- Leveraging technology to provide affordable and innovative products/ services across customer segments
- Offering differentiated products/services tailored to different service segments

- Providing reliable telecom services that are value for money
- Providing a conducive work environment with strong focus on performance
- Attracting talent and keeping them motivated
- Enhancing employees skills and utilizing them effectively
- Encouraging and rewarding individual and team/group performance
- Establishing efficient business processes enabled by IT
- Changing policies and processes to enable transparent, quick and efficient decision making
- Building effective IT systems and tools

1.15.1.2 Mahanagar Telephone Nigam Limited

MTNL was started on 1st April, 1986 by the Government of India to improve the quality of telecom services, expansion of the telecom network, and set up new services and to raise revenue for telecom development needs of India's key metros: Delhi & Mumbai. MTNL is the prime provider of fixed-line telecom service in the two Metro Cities Delhi and Mumbai. It offers mobile services in Delhi including four surrounding towns Noida, Gurgaon, Faridabad & Ghaziabad. Mumbai city provides services along with the areas falling under the BMC , New Mumbai Corporation and Thane Municipal Corporation.

The authorized capital of the Company is Rs. 800 Crores. The Paid up Share Capital is Rs. 630 Crores divided into 63 Crores share of Rs. 10 each. At present, 56.25% equity shares are held by President of India & her nominees and remaining 43.75% shares are held by FIIs, Financial Institutions, Banks, Mutual Funds and others including individual

investors. MTNL has been given Navratna status in 1997 and was listed in New York Stock Exchange in 2001.

In more than last two decades of its operations, there has been overall development & growth and better operational efficiency. Currently, MTNL is providing a host of telecom services that include fixed telephone service, GSM & CDMA based telecom service, Internet, ISDN and Leased Line services, MTNL has been in the heading of offering state of the art technology based telecom services to its customers at most reasonable prices. MTNL has been the first to open some of the latest telecom technologies in the country like ADSL & VDSL in broadband, IPTV on MPEG4 , VOIP and 3G Mobile service.

To fulfil the broadcast and other requirement such as carrying of HD TV stream, security requirements, games data etc the most important features of Telecom infrastructure were specially created by MTNL for Common Wealth Games-2010 in less than a year time frame.

After closing of the games the network elements were used to strengthen the exiting IP - MPLS spine networks of MTNL in Delhi Metro & Mumbai Metro enabling MTNL to fulfil all its present and future requirements as well as to make possible it to provide wholesale bandwidth connectivity to other telecom operators, Banks, Corporate Houses , Institutions and various other Govt. Agencies on lease /rental basis support.

MTNL is providing telecom services beyond limitations through its Joint Ventures and Subsidiaries. MTNL is available in Nepal through its Joint Venture United Telecom

Limited and in Mauritius by its 100% subsidiary Mahanagar Telephone Mauritius Limited.

1.16. Private Telecom Operators

1. Bharti Airtel:

Bharti Airtel is a leading worldwide telecommunications company with operations in 20 countries throughout Asia and Africa. It has it's headquarter in New Delhi. It ranks amongst the top 4 mobile service providers internationally in terms of subscribers. In India, the company's product range include 2G, 3G and 4G wire line services, mobile commerce, fixed line services, high speed ADSL broadband, IPTV, DTH, enterprise services including national & international long distance services to carriers and ILL etc. . In the rest of the area, it offers 2G, 3G wireless services and mobile commerce. Bharti Airtel had over 260 million customers across its operations at the end of March 2016. Airtel offers GSM mobile services in all the 22-telecom circles of country and is the largest mobile service provider in the India, based on the number of consumers. The group offers high-speed broadband with the best in its class network. With fixed line services in 87 cities, Airtel help to stay in touch with friends & family and keep updated round the clock. Airtel business delivers a broad portfolio of services to large Institutions/Enterprise, Government, Small & Medium businesses and carrier customers. It is India's most important and most trusted provider of telecom services, contributing services that include data, voice, network integration, data centre & managed services, ILL, enterprise mobile applications and digital media.

Indian mobile operator, Airtel has become the third largest mobile network in the world, calculated on subscriber numbers. The newest data from Ovum's World Cellular Information Service shows that Bharti's 303 million subscribers puts it behind only China Mobile (626 million) and UK-based Vodafone (403 million) in terms of subscribers.

According to Bharti chairman, Sunil Bharti Mittal , a low-cost business model based on outsourcing, which permitted it to expand services rapidly. Ovum's WCIS data tracks worldwide mobile subscriptions, KPIs, financial and operational indicators, among others. These are the top 5 mobile networks, given **Table 1.11:**

Table 1.11 World top Six Mobile operators with number of connection as on March, 16

Operator	Connections (millions)
China Mobile	851.2
Vodafone Group	469.7
Bharti Airtel	348.1
America Movil	289.7
Telefonica	276.5
China Unicom	265.1

Source: http://businesstech.co.za/news/mobile/92264/the-biggest-mobile-networks-in-the-world/

2. Reliance Telecom:

Reliance Group, founded by Shri Dhirubhai Ambani ranks among India's leading private sector business houses in terms of valuations. The group has business expansion that

range from telecom (RCL) to financial services (Reliance Capital Ltd) and the production and distribution of power (RPL and RIL).

Reliance Group's flagship company, RCL is India's leading and truly integrated telecom service provider. The Company has a customer base of above 100 millions including over 2.8 million individual abroad retail customers. Its corporate clientele includes over 39,000 Indian and multinational corporations counting small and medium enterprises and over 290 worldwide, regional and domestic carriers.

It has established a across the country next generation, integrated, convergent digital network that is competent of supporting state of the art services spanning the entire communications value chain, covering over 21,000 towns and cities and over 400,000 villages in rural area. It owns and operates the world's largest NGN IP enabled connectivity infrastructure, comprising over 280,000 kilometers of OFC systems in India, Europe, USA, Middle East and the Asia Pacific region.

Other major group companies of this group are - Reliance Power, Reliance Infrastructure and Reliance Capital – which are widely recognized as the market leaders in their respective areas of operation in India

3 Reliance Jio:

It is first LTE (Long term Evolution) mobile network operator in India. It is a entirely owned subsidiary of Reliance Industries headquartered in Mumbai City, which provides wireless 4G LTE service network and is the only 100 % VoLTE operator in the country having coverage across all 22 telecom circles in India.

The services were first offered to Jio's partners and employees on 27 December 2015 on the eve of 83rd birth anniversary occasion of late Sh. Dhirubhai Ambani, who was founder of RIL , and later services were commercially inaugurated on 5th September 2016.

The company launched its 4G mobile services throughout India in the third quarter of 2016-2017.

The company has a network having more than 250,000 km of O.F. cables in the country, over which it will be collaborating with local cable operators to get more connectivity for its broadband services. With its multi-service operator license, it will also serve as a TV service provider and will offer television-on-demand on its network country wide.

In June 2015, it tied up with domestic handset maker Intex to provide 4G handsets enabled with voice over LTE feature. Through this, its policy to offer 4G voice calling as well rolling out high-speed Internet services using a optic fibre network, additionally the 4G network. On the other hand, in October 2015, it announced that it would be introducing its own mobile handset brand named LYF.

On 25th January 2016, the Jio launched its LYF Smartphone series starting with Water 1, using its chain of retail outlets, Reliance Retail. Three more handset models have been released so far, namely Water 2, Earth 1, and Flame.

Jio-net Wi-Fi : Earlier to its pan-India launch of 4G data and telephony services, it has started providing free Wi-Fi hotspot services in major cities throughout India including Gujarat, Andhra Pradesh, Madhya Pradesh, selected locations of Mumbai in Maharashtra, Kolkata in West Bengal, Lucknow in Uttar Pradesh, Bhubaneswar in Odisha, in

Utarakhand, in Meerut in Vijayawada among others.

In March 2016, it started providing free Wi-Fi internet to audience at six cricket stadiums hosting the 2016 ICC World 20-20 matches. Jio-net was provided in Wankhede Stadium, Punjab Cricket Association Mohali, Himachal Pradesh Cricket Association Stadium – Dharamshala-, Chinnaswamy Stadium –Bengaluru-, Feroz Shah Kotla –Delhi-, and Eden Gardens –Kolkata-in India

Jio apps

In May 2016, Jio offered a bundle of multimedia apps on internet as part of its future 4G services. While the apps are available for download for all, a user will need a Jio SIM card to use it. In addition, maximum apps are in developing phase Subsequent is a list of te apps:

- My-Jio - Manage Jio Account and Digital Services
- Jio-TV - A live TV channel service
- Jio- Cinema - An online HD video library to use
- Jio -Chat Messenger - An immediate messaging app
- Jio- Music - A music media player
- Jio-4GVoice - A VoLTE phone simulator
- Jio -Mags - Electronic-reader for magazines
- Jio –Xpress-News - A news and magazine service aggregator
- Jio -Security - Security application
- Jio- Drive - Cloud-based backup tool for users
- Jio -Money Wallet - An online payments-wallet application
- Jio -Switch - Transfer contents

Affordable Devices: It has worked with all the principal device manufacturers of the world to ensure availability of 4G LTE smart phones across all POS – from ultra-premium models on one hand, to entry level models on the other.

Digital Currency: It delivers a new India which will use digital currency in its place of paper money for a extra secure and convenient way to transact. Jio Money is digital currency and digital payments business, will play a critical role in this by offering a platform for ubiquitous, affordable and secure digital gateway payments.

Jio Drive: Micro and small businesses will quickly have access to cutting-edge cloud storage technologies which were once reasonable to big companies only, giving them a new boundary to compete on a global landscape. It is an application that brings powerful cloud capabilities to every Smart phone. Using it, anybody can store, sync and share any content between their devices and also with others.

Digital Education: Teachers and students far from remote areas can connect with ont-to-one, crowd-source knowledge and get new age learning techniques and thus raise the level of education to a completely different plane.

Digital Healthcare: Specialist medical advice would be available alltime, everywhere - with medical practitioners will be able to grow their practice without restraint, and provide quality of life to the Crores that make up our country.

Digital Entertainment and social connectivity: Jio Chat is a dominant communication application that joins chat, video calling , voice, conferencing, file sharing, photo sharing and so on. It enables users to watch HD TV always, everywhere on any device, from number of channels, across different categories and languages. It beats is a premier digital music streaming service that delivers instant access to millions of songs and

playlists.

Jio Mags and Jio News: It Provide right of entry to the most popular collection of magazines and news from chief publishing houses across multiple languages worldwide.

Digital Entrepreneurship: It is building is a influential platform on which a range of loaded digital products and services can be offered - digital commerce, digital currency, digital education, digital healthcare, digital Mandies , e-governance, Smart Cities and the IOT. It does not matter whether these services are fashioned by Jio itself, its ecosystem partners or anyone internationally. It is committed to the philosophy of Net Neutrality. Reliance is creating the most widespread and future-proof system in India, and perhaps, in the world. It will offer next generation legacy-free digital services over an end-to-end all-Internet Protocol network, which can be smoothly upgraded even to 5G and beyond. Additionally to the existing across the country 2300 MHz spectrum and 1800 MHz in 14 circles, it put over Rs 10,000 Crore during this year's auction to obtain 800 MHz spectrum in 10 circles/states and 1800 MHz spectrum in 6 circles/states. This brings the total investment in spectrum assets to almost Rs 34,000 Crores. It now has the biggest footprint of liberalized spectrum in the country, acquired in an very cost effective manner.

Reliance Jio has infra of more than 2.5 Lakh kilometres of O.F. cables, covering 18,000 cities and more than Lakh villages, with the aim of covering 100% of the India’s population by 2018. It has an original end-to-end capacity to give out in tune of 100 million wireless broadband and 20 million FTTH. Jio has also built nearly half- million square feet of cloud data centres and a multi capacity international network. The infrastructure is being built in corporation with some of the world’s most technologically

superior companies. FY 2016-17 will be the first full year of commercial operations.

4. Vodafone

It is India is 100% stake having Vodafone Group. It started operations in 1994 when its predecessor Hutchison acquired the cellular license for Mumbai. The Vodafone was started operations in India in September 2007, after Vodafone, it acquired a majority stake in Hutchinson Essar. From a single operation base with 31 million subs base, the company has expanded its operations across the India to cover all 22 telecom circles and service 198 million subs. This journey is a strong indication of Vodafone's commitment and success in a highly competitive and price sensitive market.

5. Idea Cellular

It is an Aditya Birla Group Company, countries first truly Multinational Corporation. It is a pan-India integrated GSM operator giving 2G and 3G services, and has its own NLD/ ILD /ISP license. It has acquired spectrum to launch 4G services across ten key markets in India and has started multiple steps towards introduction of 4G LTE services on 1800 MHz band, in a step-by-step manner from FY 2016 onwards. With revenue in tune of $5 billion; revenue market share of almost 18.2% ; and subscriber base of over 165 million, It is one of the top three mobile operators. It is the 6^{th} largest mobile service operator in the world, based on number of subscribers in single country operations. It carries traffic of over 2 billion minutes/day. It has a deep rooted network across the length and breadth of the country comprising of over 1,49,196 cell sites covering 7,513 towns and 3,63,580 villages as on 2016.

Using the most recent in technology, it provides world-class service delivery through the

most extensive network of POS, comprising of nearly 6,752 Idea POS. Its customer service delivery platform is ISO 9001:2008 certified, enabling it the only operator in the country to have this standard certification for all 22 service areas/states and the corporate office. It has constantly stayed ahead of the industry in VLR reporting. Its thought leadership on Mobile Number Portability, with Net Gain of over 14 million customers as on June 30th , 2015, has brought it to stay as the top gainer among other top telecom players. Every 4th mobile user who applied choice through MNP chooses Idea.

It has been a leader in introducing customized product offerings for segmented customers. It is the first mobile service operator to set up innovative VAS in the Indian telephony market, and has kept itself ahead of the industry in data product offerings. Due to continuous growth of mobile broadband in India, the services have been delivered over 37.2 million data users. Today, data contributes over 17.7 % of its service's revenue. It has received a number of national and international recognitions for its path-breaking innovations in mobile telecom products and services. It has won the prestigious Voice & Data Telecom Leadership Awards-2014 under the Leadership Recognition class "for various successful initiatives and deployments in the areas of Business Services, Internet & Broadband, Business Analytics, Information Security, and Customer Service". It was also known as "Most Innovative Telecom Service Provider of the Year" and "Mobile Data Service Provider of the Year by Frost & Sullivan Asia Pacific ICT Awards 2015. Idea won "Dataquest Business Technology Award" in Analytics category for the "Implementation of end-to-end Campaign Management solution".

6. Tata Indicom

Tata Teleservices Limited is flagship of the Tata Group's. The Tata Group had revenues

of approximately USD 70.8 billion in Financial Year 2008-09, and includes more than 90 companies, more than 363,039 employees worldwide and more than 3.5 million shareholders. Established in 1996, TTL is the pioneer of the CDMA 1-x technology platform in India. It has started on a growth path since the acquisition of Hughes Telecom Ltd by the Tata Group in 2002. It started mobile operations in January 2005 under the name Tata Indicom and today enjoys a across the country presence through existing operations in all of India's 22 telecom Circles/States. The company is also the market leader in the fixed wireless telephony market. The company's network has been marked as the 'Least Congested' in India for five successive quarters by the Telecom Regulatory Authority of India through independent surveys.

TTL now also has a presence in the GSM space, through its JV with NTT DOCOMO of Japan, and offers various products and services under the TATA DOCOMO brand name. It arises out of the Tata Group's strategic alliance with Japanese telecom major NTT DOCOMO in November 2008. It has received a pan-India license to operate GSM telecommunication services—and has also been allotted spectrum in 18 telecom Circles. The company has rolled out GSM services in 17 of India's 22 telecom Circles/States in less than a year. It marks a significant milestone in the Indian telecom landscape, and has already redefined the very face of telecom in India, being the first to pioneer the per-second tariff option—part of its 'Pay for What You Use' pricing paradigm. Tokyo-based NTT DOCOMO is one of the world's leading mobile operators—in the Japanese market, the company is the clear market leader, used by over 50 per cent of the country's mobile phone users. Today, Tata Teleservices Ltd, along with Tata Teleservices (Maharashtra) Ltd, serves nearly 70 million customers in more than 450,000 towns and villages across

the country, with a bouquet of telephony services encompassing Mobile Services, Wireless Desktop Phones, Public Booth Telephony and Wire line Services.

7. Sistema

It was Established in 1993, today it is a large private investor operating in the real sector of the Russian economy. Its investment portfolio comprises stakes in mostly Russian companies from various sectors of economy, including telecommunications, retail, utilities, high tech, pharmaceuticals, pulp and paper healthcare, railway transportation, agriculture, finance, mass media, tourism, etc. It is the controlling shareholder in most of its portfolio companies. It's focus is on improvement of the operational efficiency of acquired assets through restructuring and gaining industry partners to enhance expertise and reduce financial risks.

8. Aircel

Aircel is India's 5th largest and fastest growing GSM mobile telecom service provider with a customer base of 65.1 million. It is a cross country operator with a presence across 22 circles. The company offers voice & data services ranging from post-paid and prepaid plans, 2G and 3G services, Broadband Wireless Access, Long Term Evolution to Value-Added-Services. Additionally to providing premium internet access solutions to facilitate data intensive live streaming Apps, Aircel has also cemented the way to be amongst the first to offer 3G and 4G LTE services to customers. It has successfully bid for 3G licenses/ spectrum in 13 Circles/states, with BWA spectrum also obtained in eight of these states. Aircel's 3G rollout has been the best roll out ever in the Indian Telecom Space. Aircel is hopeful about the data bundling in its key markets.

9. Videocon

Videocon Telecommunications Limited, a Videocon flagship company offers GSM mobile services GSM service under the brand name Videocon. The services are already up and running in various states. The Videocon Group is a $10 billion, worldwide business conglomerate with a strong presence in Household, Oil & Gas, Consumer Goods, Retail, Telecom, DTH and the Power sector etc.

This group has constantly leveraged a culture of innovation to develop a range of latest market products. The Group has different manufacturing facilities globally and R&D centres spread across Americas, Europe and Australasia that are continually working towards creating worldwide quality products deploying the latest technology. It is one of the largest distribution networks in India with a nation-wide presence. It has a full range of products in Washing Machines, LCD's and CTV's, ACs, Refrigerators, Home Theatre systems, food processors, microwave ovens, and sophisticated small home appliances. Just the group also successfully launched a range of Mobile Handsets and NGN D2H television services and world's first satellite TV.

10. Telenor India

The subscriber base of this company is over 48 million. It is part of Telenor Group, one of the world's main mobile operators with 192 million mobile customers.

Since commencing operations in 2009, it has been constantly acknowledged for its best-in-class network, unique distribution and unmatched customer centricity. It operates in Andhra Pradesh, Bihar, Gujarat, Maharashtra, Uttar Pradesh

11. Quadrant Tele-Ventures

Quadrant Tele-ventures Limited is a telecoms services provider based in India. Started operations in 1946, it provides Landline services, Internet services, leased line services,

CDMA wireless services and GSM mobile services in the Punjab telecom circle. It has 1.6 million wireless, of which 27, 768 CDMA and 1.3 million GSM subscribers and 0.2 million wire-line subscriptions (July 2012) and 0.1 million broadband subscriptions (March 2012). In March 2010, it had launched its GSM wireless services in Punjab Telecom circle.

In the year ended March 2012, Quadrant Tele-ventures Limited generated INR 2.8 billion in revenue with an annual growth of 21.7% and net profit of 1.7 billion, with an annual decline of 22.7%

9. Loop Mobile

Usually referred to as LOOP and formerly known as BPL Mobile, was an Indian mobile network operator. On 18 February 2014, Bharti Airtel announced that it had agreed to acquire Loop Mobile for ₹700 Crore (US$100 million). At its peak, Loop offered both prepaid and post-paid GSM cellular phone coverage in Assam, Kolkata, North East, Mumbai, Madhya Pradesh, Haryana, Orissa, Punjab and Rajasthan after receiving a license to operate across 21 telecom circles from the Department of Telecommunications

1.17 Future Growth Opportunities of Indian Telecom Sector

India is currently the worldwide second-largest telecommunications market after china and has registered study growth in the past two decades. The country's mobile market is growing rapidly enough and will contribute substantially to India's gross domestic product, according to report prepared by GSM Association in collaboration with the Boston Consulting Group. It has touched figure of 120 Crore as on 31.03.17.

The liberal policies of the Indian Government have been instrumental along with strong subscriber demand in the rapid growth in the present telecom sector. The government has making sure easy market access to telecommunication equipment and a fair and proactive policy framework that has ensured availability of telecommunication services to customers at affordable prices. The deregulation of foreign direct investment parameters has made the sector one of the fastest rising and a top five employment opportunity generator in the country. According to a report of TRAI, two other linked aspects for market growth are availability of spectrum and availability of resources for network rollout and expansion. The Indian government is now looking into these two areas. The 79% hike in FDI has been made clear by the government to facilitate continuous flow of investments to expand the reach of the mobile operators.

To appreciate full market potential and achieve the forecasts figures, telecom operators have to work on a segmented policy and spotlight on the following five key strategies given below:

- Mobile in the hands of every urban/rural youth
- Mobile in the hand of every labour/executive/businessman/ worker.
- Mobile in each household

- Mobile penetration in each town/village
- Mobile Phones reasonably priced and available wherever mobile services available

Jio has expanded beyond the speculations of everyone. It has captures approx. 11% market share. As per TRAI reports, presently it is delivering best ever speed among all the operators which is in between 4 Mbps to 10 Mbps. It has changed the market scenario totally. Nobody is speaking about voice but everybody is bothered about data speed.

Airtel, Vodafone and Idea, in that order, are the top three telecom companies in India with combined revenues of Rs 166,000 Crore and net profits of Rs 12,000 Crore. These companies are struggling hard to survive in present neck to neck competition. The first phase of the violent battle will benefit the ultimate consumer the most as the coming - competition will increase range of services, better quality at lower costs. But, as each of these three aspects play out, it is also probably to expand the market, as it did in year 2002, and finally also benefit competitors in the long run.

The heart of the fight will be to retain and attract finest customers of data services, which will be the foundation of the telecom industry's growth going forward with revenue from voice calling maturing at best. Pressure of competition could well bring back the 2009-2010 period that saw telecom operators drop rates up to 50%. Even with comparatively stable pricing, service providers have been counting on data to compensate the slowdown in voice, but those rates are under pressure.

Many are speculating that Jio's entry will accompany in free calling and halve data rates. At the recent AGM of RIL, chairman Mr. Ambani indicated at data being available at Rs 80 per GB, compared to the average of Rs 150 offered by other operators. Furthermore, the Jio platform over time delivers to convert VoIP. It means that the cost of a call to a consumer will be the nominal POI charge of 14 paisa per minute, instead of the average of 50 paisa.

Jio estimates the hypothetical cost/MB for a data-only operator like Jio to decline from Rs 0.24/MB in FY18 to Rs 0.11/MB in FY25. This may cause the price-point going to Rs 0.10/MB with operator looking to propose Rs 300 per 3GB (Current Rs 300 for 1GB),as per Bank of America Merrill Lynch said in a recent report.

Before Jio can entirely adopt the data-based voice service, its venture with R.Com and probable spectrum trading and sharing deals will help with a back-up customary voice network, the costs for which the company will soak up for up to 18 months. In the meantime, the first stage of telecom consolidation seems to have already started with R.Com announcing a planned merger with Aircel, a merger that will take a powerful 4th place after Idea Cellular.

Telecom Industry experts say that declining prices may not mean lower monthly bills; customers may step up consumption of image and video sharing/streaming.

It has happened in the past years. In 2002, Reliance offered bundled phone instruments, with free incoming calls and lowered calling rates to half. Competitors matched the offer, pushing the industry into an nuance point; India became the fastest growing telecom market for seven years. The industry situation is different this time around with well

well-established incumbents and deep mobile penetration, especially in urban areas as well as in rural areas after entry of Jio.

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Chapter-II

Review of Literature

2.1 Review of Literature

This chapter describes literature review and its assessment of the supporting the research objectives. It elaborates the search devoted to service quality and customer satisfaction as a major factor in the mobile telecommunication sector in India. The objects of this chapter are to focuses on various aspects of customer satisfaction, service quality and their interrelationship. In initial discussions, the chapter deals with the history and development of the concept of customer satisfaction, perceived value, perceived price, customer loyalty and relationship marketing. It also highlights relationship of various attributes on customer satisfaction. Further it describes about ultimate goals of any institution to survive i.e. customer retention, loyalty and profit. Lastly, conclusions to this chapter are drawn. Literature associated to following interest areas will be discussed in length in this chapter.

- Customer Satisfaction
- Expectation Disconfirmation Theory on Customer Satisfaction
- Behavioral Intention and its relationship with Customer Satisfaction
- Perceived Value and its relationship with Customer Satisfaction
- Service Quality and its relationship with Customer Satisfaction
- Relationship Marketing and its relationship with Customer Satisfaction

- Customer Relationship Management and its affiliation with Customer Satisfaction
- Marketing Mix and its association with Customer Satisfaction
- Perceived Switching Cost
- The Customer Satisfaction-Retention-Loyalty Chain
- Marketing Intelligence
- Customer Segmentation
- Previous Studies on Customer Satisfaction in Mobile Telecom Sector

2.2 Customer Satisfaction

The most of the interpretations obtained from various authors reflect the theory that satisfaction is a feeling which results from a process of evaluating what has been received against what was expected including the purchase decision itself and the needs and wants linked with the purchase (Armstrong, Adam, Denize, & Kotler, 2014). (V. Zeithaml, n.d.) stated that satisfaction is the customers' evaluation of a product or service in terms of whether that product or service has met their needs and expectations. As per (Van Der Wiele, Boselie, & Hesselink, 2002) satisfaction is a positive, affective state resulting from the appraisal of all aspects of a party's working relationship with another. The definition provided by (Van Der Wiele et al., 2002) has been used for this study. All the above discussions indicate the importance of identifying customer satisfaction (Gulledge, 1996) (Metawa & Almossawi, 1998). However, this is not an easy task because customers' expectations are hard to measure and firms come to know only after the product has already been delivered. (BAMFO, 2009) (Jahanzeb, Fatima, & Khan, 2011) examined customer loyalty in the telecom industry in Pakistan and found that

customer loyalty is formed mainly by: service quality, trust, staff loyalty, and switching cost. The results of this study are in line partially, with a study by (Boohene & Agyapong, 2011) of 460 clients of Vodafone Telecom Company in Ghana. This study accomplished that satisfaction does not necessarily lead to loyalty, while service quality was found to be strongly and positively associated with loyalty. However, it can be recognized from the findings of this study that customer satisfaction is already developed into service quality. Customers perceive service quality positively if they are satisfied with the service provider (operator) and with the services delivered to them. The importance of service quality in the choice decision for a telecom operator was also emphasized by (Rahman, Haque, & Ahmad, 2011) who completed a study of 400 mobile telecom customers from major cities in Malaysia. This study revealed that network quality is one of the most significant factors in largely service quality. Besides service quality, the study found that price plays a major role in the choice criteria for mobile telephone operators in Malaysia. It was concluded that in order to retain customers and attract new customers, service providers should provide "service with reasonable quality without any secreted price, the two most significant determinants of consumer satisfaction (Kotler & Keller, 2006) view customer satisfaction as a person's feelings of pleasure or displeasure resulting from comparing product's perceived performance in relation to his or her expectation. In a similar type of definition,(Juran,1991) proposed that customer satisfaction is the result achieved when a service or product features react to customers need and when the company meets or exceeds customer's expectation over the lifetime of a service or product or. Customer satisfaction is described by(Bolton & Drew, 1991a) as a judgment made on the basis of a definite service encounter. (Oliver,

1981) viewed satisfaction as a touching reaction which influences attitude. In a university framework, (Elliott & Shin, 2002 :198) found that student satisfaction was a "short-term attitude resulting from an evaluation of the student's educational experience or as a student's subjective evaluation of the various outcomes and experiences with education and campus life". Most definitions support the view of consumer satisfaction as a answer to an appraisal process, however(Giese & Cote, 2000) established that there is a important theme of consumer satisfaction as a summary concept (a fulfilment response (Oliver, Rust, & Varki, 1997) affective response (Haistead, Hartman, & Schmidt, 1994) overall evaluation (Fornell, 1992) psychological state (Howard & Sheth, 1969). In this research, customer satisfaction is defined as the results achieved when service or product features respond to customers need.

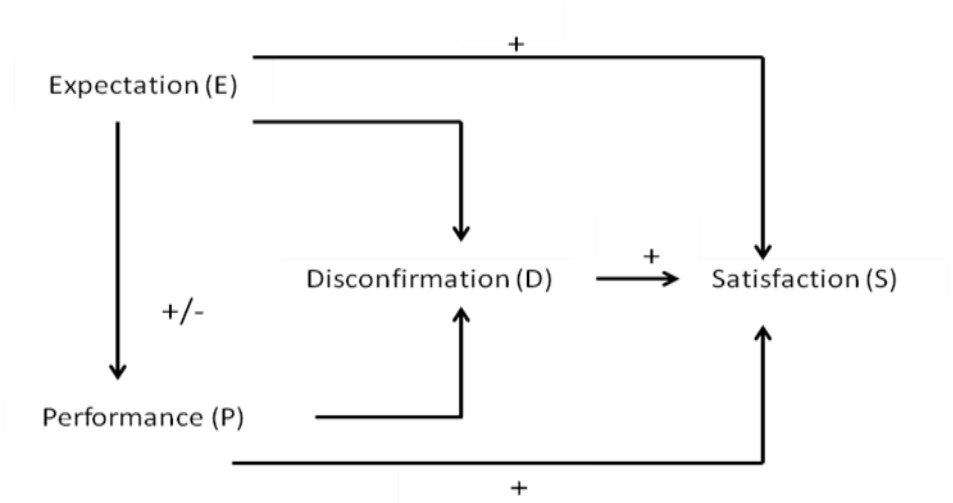
(Brown, Malveau, & Mowbray, 1998) argue that there is a association between satisfaction and profitability and that customer satisfaction evolution should comprise of an understanding of the gap between customer expectations and performance perceptions. Customer satisfaction discussions reveal the existence of a major relationship between service quality and customer satisfaction in higher education (Marzo Navarro, Pedraja Iglesias, & Rivera Torres, 2005). In between the two (Wang & Shieh, 2006) described that customer satisfaction was the level of service quality performance that met user's expectation.

2.2.1 Expectation Disconfirmation Theory on Customer Satisfaction

The theoretical model is based on the social psychology and organizational behaviour. (Olshavsky & Miller, 1972) published an article about “Customer expectations, product performance and perceived product quality " Later (R. E. Anderson, 1973) published one more article "customer dissatisfied: disconfirmation expectations and perceived quality effect ". These two studies make up the basis of this model.

The four major constructs in the model are: expectations, performance, disconfirmation, and satisfaction. Expectations shows anticipated behaviour (Churchill Jr & Surprenant, 1982). They are logical, representing expected product attributes at some point in the future (Spreng & Mackoy, 1996). Prior to customer purchases, customer develops expectations from the product outcome or performance; subsequent to purchase by customer, he judged the actual product performance. Then customer measures the gap between expectation and actual performance, this defined as “disconfirmation”. Disconfirmation is hypothesized to affect satisfaction, with positive disconfirmation accountable for satisfaction and negative disconfirmation accountable for dissatisfaction. If a product performs ahead of expectations (positive disconfirmation), it’s result will be post-purchase satisfaction. If a product fails on expectations (negative disconfirmation) the customer is likely to be displeased(Oliver, 1980) (Spreng & Mackoy, 1996). The expectancy disconfirmation model of customer is shown in **Figure 2.1:**

Figure 2.1 The Expectancy Disconfirmation Model of Customer Satisfaction



The Empirical Support for Six Linkages has been summarized in given **Table 2.1**

Table 2.1 Summary of the Empirical Support for Six Linkages

From (Oliver et al., 1997) (Churchill Jr & Surprenant, 1982)

Constructs (Variables)	Literature
Expectations - Performance Linkage	(Boulding, Kalra, Staelin, & Zeithaml, 1993) (Churchill Jr & Surprenant, 1982) (Oliver, Balakrishnan, & Barry, 1994)
Expectations - satisfaction Linkage	(Olshavsky & Miller, 1972) (R. E. Anderson, 1973) (Oliver, 1980) (Olson & Dover, 1979) (Churchill Jr & Surprenant, 1982) (Oliver & DeSarbo, 1988) (Tse & Wilton, 1988) (Bone, Shimp, & Sharma, 1990) (Szajna & Scamell, 1993)
Expectations – Disconfirmation Linkage	(Churchill Jr & Surprenant, 1982)
Performance - Disconfirmation Linkage	(Swan & Trawick, 1981) (Churchill Jr & Surprenant, 1982) (E. W. Anderson & Sullivan, 1993) (Olson & Dover, 1976)
Performance – Satisfaction Linkage	(Churchill Jr & Surprenant, 1982) (Swan & Trawick, 1981) (Bolton & Drew, 1991a) (E. W. Anderson & Sullivan, 1993) (Oliver, 1993) (Mizuno, Imanishi, & others, 1992) (Simester, Hauser, Wernerfelt, & Rust, 2000)
Disconfirmation– Satisfaction Linkage	(Olson & Dover, 1976) (Churchill Jr & Surprenant, 1982) (Rust & Oliver, 1993) (Oliver, 1980) (Oliver, 1977) (Oliver et al., 1994) (Oliver et al., 1994)

2.2.2 The Relationship between Customer Satisfaction and Behavioural Intention

Customer satisfaction has been taken as a basic element of long-term consumer behaviour (Oliver, 1980). The relationship between customer satisfaction and behavioural intentions has been acknowledged (Bearden & Teel, 1983). It has been anticipated that

customers satisfaction of service value influences purchase intentions and behaviour intentions (Bolton & Drew, 1991a), these behavioural intentions may be either positive, for example loyalty intention, customer retention, and word of mouth, or negative, for example switching intention or customer rejection.

2.2.3 Perceived Value

A variety of studies have defined perceived value. It is defined as the result of the individual comparison between perceived overall benefits and the perceived costs paid by the customer(V. A. Zeithaml, 1988). Perceived value is the consequences or benefits customers receive in relation to whole costs (which include the price paid plus other costs associated with the purchase). In straightforward language, value is the gap between perceived benefits and costs. Though, what constitutes value seems to be highly personal, and may vary widely customer to customer (Holbrook, 1994) (V. A. Zeithaml, 1988). Only the customer rather than a operator can evaluate a perceived value of a product/service and the idea of customer perceived value is very subjective and personal (Anantharanthan Parasuraman, Zeithaml, & Berry, 1985). (Sweeney & Soutar, 2001) proposed the PERVAL dimensions including “functional dimension”, “emotional dimension” and “social dimension”. Functional dimension discloses the rational and economic evolutions made by individual. Emotional dimension represents the internal emotions or feelings exhibit by the service. Social dimension shows the social impact of the purchase made by customer.

2.2.4 Perceived Price

Price is differentiated between objective price (the real price of a product) and perceived price (the price as determined by the consumer) (Jacoby & Olson, 1977). This difference indicates that the objective monetary price is often not the price determined by the

consumer. (V. A. Zeithaml, 1988) also explained the components of price: objective price, perceived nonmonetary price, and sacrifice. Few researches expose that consumers do not always remember the objective prices of products, but they do evaluates prices in ways that are significant to them (V. A. Zeithaml, 1982,1983,1988). Perceived price can be defined as "the customer's conclusion about a service's average price in comparison to its competitors" (Chen, Gupta, & Rom, 1994). Perceived price targets on customers interest as to whether they are being charged over or near about the same as charged by (V. A. Zeithaml, 1988) argue that consumer perception of value is very much related to the perception of price, and that the measurement of perceived value includes price perception. The National Council of the Green Consumers Network (NCGC 2012) in Korea exposed that many mobile phone subscribers were dissatisfied with the different types of service charges. (Ryu & Han, 2010) establish that the perceived price has a imperative effect on the relationship between quality and customer satisfaction in the quick-casual restaurant industry. That is, customers' perception of a reasonable price enhances the effect of service quality on customer satisfaction.

2.2.4.1 *The Relationship between Perceived Value and Customer Satisfaction*

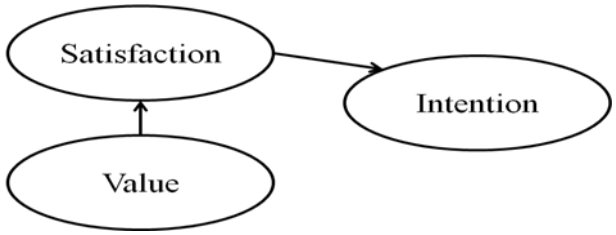
There are numerous researches in the service marketing field carried out. In line with (Andreassen & Lindestad, 1998) , customer perceived value was positively associated with customer satisfaction in the service sector. (Patterson & Spreng, 1997) also explained that perceived value had a positive and straight relationship with customer satisfaction. Whereas it is argued that value has a straight forward impact on how satisfied customers are with the service provider (E. W. Anderson, Fornell, & Lehmann, 1994) and that satisfaction is build upon on value (Ravald & Grönroos, 1996), in

evaluating services, little attention has been paid to customer value (Lemmink, de Ruyter, & Wetzels, 1998). It has been projected that behavioural intentions are stanch in part of perceived value (Bolton & Drew, 1991b).

In decision making to go back to the service provider, customers are likely to consider whether or not they received “value for money". In addition, it is promising that customer satisfaction may be based mainly on the service experience (i.e. service quality dimensions) and that perceived value is more significant with respect to future intentions. As a result, for this research, it is expected that perceived value contributes directly to customer satisfaction which, in turn, leads to future intention.

The model of relationship between perceived value, customer satisfaction, and intension by(Patterson & Spreng, 1997) proposed in **Fig 2.2** below:

Fig 2.2 Model of Relationship between Perceived Value, Customer Satisfaction, and Intension



Source: Patterson & Spreng (1997)

2.2.5 Relation Ship Marketing

The perception of the relationship marketing started within the fields of services marketing and industrial marketing (Ford, 1980);(Christopher, Payne, & Ballantyne, 1991); (Gummesson, 1991) ; (Lindgreen, Palmer, & Vanhamme, 2004). The concept thrusts upon customer satisfaction and customer retention as the long-term value for the organization

(defensive marketing) rather than customer dealings (offensive marketing) (Kotler, Saliba, & Wrenn, 1991) (Vavra, 1992), Or, cynical marketing concerns on reducing customer defection (churning) and enhance customer loyalty, whereas offensive marketing focuses on adding new customers and improve customers buying frequency (Fornell & Wernerfelt, 1987). These days, relationship marketing is taken as a strategy (Berry, 1983) (Gummesson, 1993) in which it is aimed to improve customer relationship and profitability (Grönroos, 1994) (Storbacka, Strandvik, & Grönroos, 1994) (Reinartz, Thomas, & Kumar, 2005) ; (Bügel, Buunk, & Verhoef, 2010)(Saren, 2007) defines customer relationship as "the creation, maintenance and reproduction of tastes, dreams, aspirations, needs, identities, desires, morality and hedonism". The concept of relationship marketing attracted substantial criticism, at the beginning, but it is known that it has made a shift in marketing. According to (Gruen, 1997): "The introduction of the relation marketing concept keep focus on seeing customers as the centre of the world and the organization around them . RM reveals the positions of suppliers and customers through a business strategy of bringing them together in helpful, trusting and mutually advantageous relationships."

Furthermore a selection of RM definitions is listed in following **Table 2.2.**

Table 2.2: RM Definitions

Source	Definition
(Berry, 1983)	*"Attracting, maintaining and – in multi-service organizations – enhancing customer relationships" (p. 25)*
(Lusch & Vargo, 2006)	*"Marketing is the process in society and organizations that facilitates country exchange through collaborative relationships that create reciprocal value through the application of complementary resources".*
(Gronroos, 1990,1994)	*Marketing is to establish, maintain, and enhance relationships with customers and other partners, at a profit, so that the objectives of the parties are met. This is achieved by a mutual exchange and fulfilment of promises."*
(Grönroos, 2007)	*"… marketing is to identify and establish, maintain and enhance, and when necessary terminate relationships with customers (and other parties) so that the objectives regarding economic and other variables of all parties are met. This is achieved through a mutual exchange and fulfilment of promises."*
(Morgan & Hunt, 1994)	*"Relationship marketing refers to all marketing activities directed to establishing, developing and maintaining successful relational exchanges."*
(Porter, 1993)	*"Relationship marketing is the process whereby both parties – the buyer and provider – establish an effective, efficient, enjoyable, enthusiastic and ethical relationship: one that is personally, professionally and profitability rewarding to both parties."*

2.2.5.1 *Relationship between Relationship Marketing and Customer Satisfaction:*

When industrial revolution started in early 1920s, the marketing theory showed particularly to group marketing because of the nature of group manufacturing and beginning of mass marketing use. The concept additionally continued to expand through the 40s and 50s. It gave business houses a break to approach a wide customer base with various needs into buying the alike product. Bunch manufacturing formed a gap between firms and consumers. From the firm's viewpoint, customization was not financially viable and did not assure greater profits. Besides, every customer's data was not accessible and there was often very modest interaction between the customer and the firm. Also, operators were not open to record and analyze customer-feedback. Therefore, there was a need of understanding about the customer service from the product apart from functionality. Service marketing practitioners projected the idea of relationship marketing as means to narrow the difference between firms and their customers. Leonard Berry was the first student in services marketing who developed the phrase "relationship marketing" (Berry, 1983). On the other hand, the concept had been leaning towards how to gain customers (Storbacka et al., 1994) . Consequently, such relationships are not essentially long term relationships where a large margin is the key goal of the relationship. The "RM "became popular in the late 1980s and early 1990s due to the moving of centre from customer acquisition to customer retention (Morgan & Hunt, 1994) ; (Sheth & Parvatiyar, 2002) . By comparing relationship marketing (RM) with the traditional transaction marketing, the following conclusions can be drawn:

In RM, the focus is not on service encounters or transactions.

RM is concerned about keeping customers and enhancing the relationship with them

Figure 2.3 shows a historical timeline of the marketing development. There are present other accounts for the emergence of RM, such as the economics of customer retention, the uselessness of the mass media, and in excess expectations from customers (F. P. Reichheld & Sasser, 1990)(Shani & Chalasani, 1992). Additionally (Sheth & Parvatiyar, 2002). categorize the major reasons for the appearance of RM:

1. The power crises and economic price rises

2. Rising of service marketing

3. Supplier partnering

Later, they also mentioned three other factors that influenced the course and definition of 'RM' as:

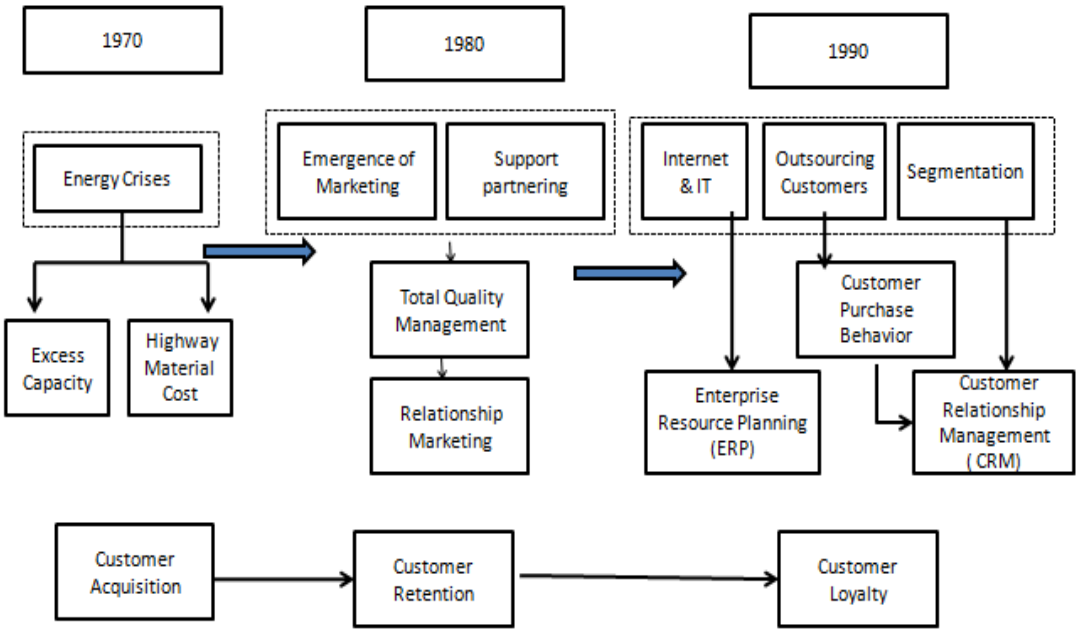
1. Consequence of internet telephony and information technology

2. Service focused marketing and

3. The network approach to business-to- business

There was also pressure from non-marketing areas such as TQM, customer value chain, balanced scorecard intellectual capital and lean production organization theory that further enriched Relationship Marketing

Figure 2.3: Marketing Changes through the Last Decades



Source: (Sheth, 2002)

2.2.6. Customer Relationship Management (CRM)

Thus, by diverting to customer orientation from the usual practices , firms were expecting to gain more market share (Bose, 2002) (Yong Ahn, Ki Kim, & Soo Han, 2003). Appearance of the One-to-One and the Customer Relationship Management concept showed the difference between customers, hence attention needs to be paid to how they perceive added value service attributes (Weitz & Jap, 1995). RM relies upon the achieving of customer needs and desires with particular significance to customer satisfaction which, in turn, leads to long-standing relationship. As per (Gummesson, 2008) ***"RM is the overriding concept for a new marketing type of marketing and CRM as techniques to handle customer relationships in practice." Moreover, he defines***

CRM as: "CRM is the values and strategies of RM – with special emphasis on the relationship between a customer and a supplier – turned into practical application and dependent on both human action and information technology."Following, **Table 2.3** lists a selection of CRM definitions as follows:

Table 2.3: CRM definitions

Source	Definition
(Payne & Frow, 2005)	*"CRM is a strategic approach that is concerned with creating improved shareholder value through the development of appropriate relationships with key customers and customer segments. CRM unites the potential relationship marketing strategies and IT to create profitable, long-term relationships with customers and other key stakeholders. CRM provides enhanced opportunities to use data and information to both understand customers and co-create value with them. This requires a cross-functional integration of processes, people, operations, and marketing capabilities that is enabled through information, technology and application."*
(Eggert & Fassott, 2001)	*"e-CRM embraces the analysis, planning and management of customer relationships with the aid of electronic media, especially the internet, with the goal of the enterprise to focus on select customers."*

Despite the advantages that RM offers, managers have yet to propose a roadmap to create sustainability and forceful advantages that RM promises to offer (Ganesan, 1994) (Morgan & Hunt, 1994). As a result, it is significant to recognize how the competitive advantages can be built through relationship marketing. The timeline of CRM evolution is represented in given **Fig 2.4**.

Figure 2.4: Timeline of CRM Evolution

Adapted from (Eshghi, Roy, & Ganguli, 2008) (Reinartz et al., 2005)**,** p. 20

First Generation > 1990	**Second Generation > 1996**	**Third Generation >2002**
Call centre management Customer service support	Integrated customer-facing Front-end (mktg., sales, service)	Strategic CRM
Sales force automation		
	ERP integration Customer analytics Complete web integration	
Goals:		
Improve service operations	Reduced cost of interaction	Costs reduction
Increase sales efficiency	Increase customer retention	Revenue growth
	Improve customer experience	Competitive Advantage

2.2.7 Marketing Mix for Service Industry

The idea of marketing mix is separated into product and service marketing mix. The service marketing mix deals with Product, Price, Place, Promotion, People, Physical Evidence and Process, which are identified as 7P's. The product marketing mix have Product, Price, Place, and Promotion, called 4P's of marketing (Hidayat & Hartono, 2010)

Product is defined as everything that can be offered into a market for attention, use, or consumption that may fulfil a need (Kotler & Armstrong, 2006). As per (Hirankitti, Mechinda, & Manjing, 2009) the service product offers service which can be explained based in the main service which represents the core benefit, and the secondary service which shows both the tangible and augmented product levels. Product is differentiated by quality, design, features, brand name, appearance and sizes (Borden, 1964).

Price is the amount of money charged for a product or service, or the total values that consumers exchange for the benefits of having or using the product or service (Kotler, Armstrong, Wong, & Saunders, 2008). Due to the intangible characteristic of services, price becomes a vital quality indicator (V. A. Zeithaml, 1981). Price is considered as the most important measurement of repurchase intentions (A Parasuraman & Grewal, 2000). It has been established the customers normally think whether they got their value for money or not (V. A. Zeithaml, 1988). Therefore, customers frequently buy products on the basis of price rather than other attributes (Lassar, Mittal, & Sharma, 1995)

Place is defined as the ease of access which potential customer links to a service such as position and delivery (Hirankitti et al., 2009). A firm should pay concentration to place decisions, because of the significance of the service and consumption occurring at

the same time and at the same place; a place that make available all information for customer, competition, promotion action, and marketing task. Managers should pay notice to how it can deliver the service at the right time and at the right place, and which sales channel should be used to deliver the desired service (Kleijnen, De Ruyter, & Wetzels, 2007). The plan of place needs efficient allocation of the firm's service among the channels of marketing (Berman, 1996) .

Promotion is defined as sales promotion, personal selling, advertising, public relations and direct marketing (Borden, 1964). Promotion is concerning a decision of how best to the related product to the aim market and to convince consumer to buy it (C. H. Lovelock, Patterson, & Walker, 1998). (Christopher Lovelock & Wright, 2001) A interactive communication program is very important in marketing strategies because it plays three major roles: delivering desirable information and proposal, persuading aimed customers to purchase a particular product, and motivating target customers to take action at pre defined times and place (C Lovelock & Wright, 2002).

Promotional actions can influence consumer's way of judgment, their emotions, their awareness as well as their purchasing. Promotion is a promotion technique, in any marketing program; it should be concerned with promotion. The product advertisement can be delivered by person sales people, radio T.V., highway media, websites on internet, press, magazine, and all other types of media.

Personnel show the service employees who make and distribute the service. It is a fact that many services take on personal interactions between customers and the service employees, and they strongly influence the customer's observation of service quality (Hartline & Ferrell, 1996) (Rust, Zahorik, & Keiningham, 1996). Personnel are of vital

significance to the delivery of service to customers. If there is no support from the personnel, a customer-orientation is not probably to get (Kelley, Donnelly, & Skinner, 1990).

The personnel interaction is much important, because it affects customer perception. The actions of all the personnel generally influence firm's success, and more training, skills, communication, advice and learning offered to personnel, they will attain to display the best possible value of the product and the company.

Process is defined as the implementation of action and function that enhances value for service with a small cost and a high advantage to customer, and it is very imperative for service than for goods. As per (Hirankitti et al., 2009) the process is obviously clear

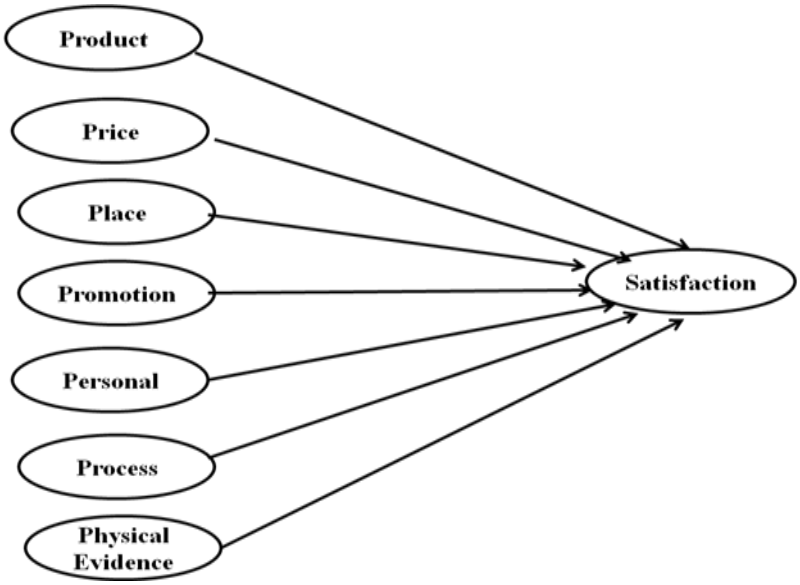
by the customer and it forms the basis of customer satisfaction with the purchase. As a result, process management make certain the availability and consistence of quality. The design and the implementation of product fundamentals are vital to the creation and delivering of product.

Physical Evidence is defined as the surroundings in which the service and any tangible products are made available for willing customers. It is of the great importance for the customer, who checks the quality of the service provided through physical evidence (Rafiq & Ahmed, 1995). Also, as per (Bitner, 1990) other visible surroundings which can persuade the impressions perceived by the customers about service quality. The appearance of the service employees can deeply affect a customer's satisfaction with a service experience(Rust et al., 1996). The surrounding environmental adornment and design also considerably influence the customer's expectations of the service (Shostack, 1977) .

2.2.7.1 Relationship between Marketing Mix and Customer Satisfaction:

Marketing is a managerial procedure by which persons and groups get what they require and want through contribution, creating and exchanging products or services values with each other (Kotler, 2005).The marketing mix is marketing technique that helps marketer to know what are their needs and want. The variables in marketing mix with 7Ps- are product, price, place, promotion, personnel, physical evidence, and process. These factors generate the best combination deals with services marketing. Particularly, the last 3Ps are used in service sector instead of than goods. (Yelkur, 2000) established that the elements in the services marketing mix influence and positively effects customer satisfaction. It further shows service organizations should pay alike attention to their employees and customers, this would increase both employee inspiration as well as customer satisfaction. Therefore, the result of study supported the argument that there is a positive relationship between the quality and satisfaction. Also, (Yayla, Kirkbir, Cengiz, & others, 2007) recognized that marketing mix has a positive effect on satisfaction and loyalty, on word of mouth communication from accounting offices in Turkey. The model of the relationship between marketing mix and satisfaction proposed by (Lumpoopinijpong, 2007) in below Fig 2.5 :

Figure 2.5 Model of the Relationship between Marketing Mix and Satisfaction



Source: (Lumpoopinijpong, 2007)

2.2.8 Perceived Switching Cost

Switching cost may be defined as " the cost of changing services in terms of time, monetary value, and psychological factor"(Dick & Basu, 1994) ; (Lai, Liu, & Lin, 2011). Switching cost includes the search cost (the cost of time spent for searching information) and the transaction cost (the cost of time and effort) (Schlesinger & der Schulenburg, 1991). In the case of telecommunication services, the aim of customers to churn reduces due to switching costs, such as time devoted for gathering information about features, network and the attempt needed for changing mobile phone service providers. Furthermore, switching cost not only causes hurdles to customer churn, but also weakens the outcome of satisfaction on customer loyalty. Their outcome show that when customers perceive that they have to spend a larger amount of time and effort to search

for service providers with a high level of customer satisfaction, they are more eager to keep their current service providers in spite of, how high or low the satisfaction is.

2.3 The Measures Defining Customer Relationship

Following enlisted are some of the measures which define customer relationship with different aspects

.2.3.1 The Customer Satisfaction-Retention-Loyalty Chain (SRLC)

The satisfaction-retention-loyalty-chain (SRLC) is a main concept that needs to be understood due to its relation to customer relationship management (CRM) and, in turn, profitability (Figure 2.6). The idea has been accepted since the early 1990s, when measuring and managing customer satisfaction became vital to firms (Heskett, Schlesinger, & others, 1994). The key point is that improving the performance of service attributes will create satisfaction (Mousavi, Adl, Rakowski, Gunasekaran, & Mirnezami, 2001).increased customer satisfaction levels will lead to greater customer retention ratio, which is a main determinant for customer loyalty, which may boost the expected retention rate (Rust & Zahorik, 1993) (E. W. Anderson & Mittal, 2000) . Instead of the self-evident nature of these positive links, the experimental evidence of research shows only mixed support (V. A. Zeithaml, 2000). There are only few researches, investigating the relationship between perception measures (service attribute quality, customer satisfaction) and action measures (word-of-mouth behaviour, purchase loyalty and long term customer relationship profitability).

Figure 2.6: The Service Quality-Customer Behaviours Chain Service Performance Customer Satisfaction

Source: (Heskett et al., 1994)

2.3.2 Behavioural and Financial Consequences of Service Quality

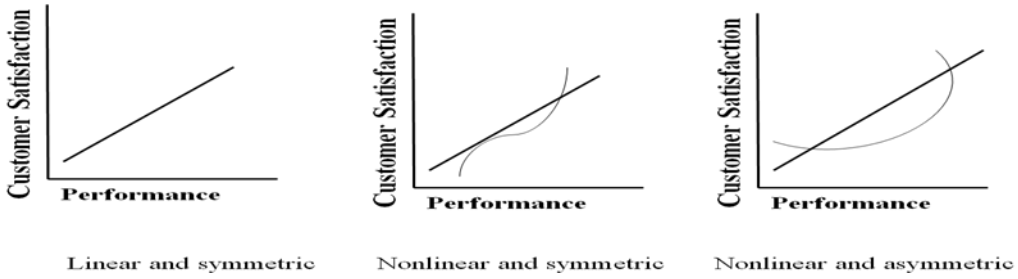
Offering a superior quality of service is considered as a key to success in today's neck to neck aggressive business environment (F. P. Reichheld & Sasser, 1990) (Anantharanthan Parasuraman et al., 1985) (Dawkins & Reichheld, 1990). During the 1980s, the main focus of firms was on improving service quality towards customer prospect (Anantharanthan Parasuraman et al., 1985). Consequently, quite a few methodologies and management guidelines were proposed (V. A. Zeithaml, Berry, & Parasuraman, 1996) such as: total quality management , quality function deployment , failure modes and effects analysis , zero defect , plan-do-check-act cycle. Though, there is no agreement on the way to estimate the impact of service quality on fiscal performance (V. A. Zeithaml et al., 1996) (Rust, Zahorik, & Keiningham, 1995). The relationship between these two variables is neither simple nor easy (Zahorik & Rust, 1992). Research on the direct relationship between customer satisfaction and profitability has shown mixed results ranging from positive to no effect (C. H. Lovelock et al., 1998) (V. A. Zeithaml, 2000) (F. P. Reichheld & Sasser, 1990). The results require in depth analysis and fail to reply questions like: How will service quality attribute be paid off ?

Or, how much should the company invest in service quality to utilize profitability? There are two approaches for answering these questions: offensive marketing and defensive marketing (Fornell & Wernerfelt, 1988) (Rust & Zahorik, 1993) (Zahorik & Rust, 1992). These approaches do not have their roots in either manufacturing or service marketing but have grown through the conventional consumer goods marketing (Storbacka et al., 1994). Offensive marketing relies on capturing new customers and enhance customers dealings (purchase frequency), whereas defensive marketing is based on dropping customer switching intention.

The primary assumption is that there is a powerful relationship between service quality attributes and customer behaviours, example e.g.; repurchase intention (Fornell & Wernerfelt, 1987,1988) (F. P. Reichheld & Sasser, 1990) (E. W. Anderson & Sullivan, 1990);. The assumption is based on the thought that customer satisfaction can be ascertain and evaluated as the difference between perception and expectation. Therefore, if the service is delivered inadequately, then the gap between customer perception and expectation will be negative and the customer will be displeased. If the gap is positive, a customer will be satisfied and happy. Additionally, this relationship is based upon the hypothesis that the relationship between service qualities attributes and customer satisfaction is direct and asymmetric. In fact, what is essential to understand for a manager is whether SQ attributes have unlike or same impact on customer satisfaction? There is no conformity about the nature of this relationship. **Figure 2.7** shows three usually found relationships between services attributes performance and customer satisfaction.

Figure 2.7: Service Attributes Performance – Customer Satisfaction Link

Customer Satisfaction



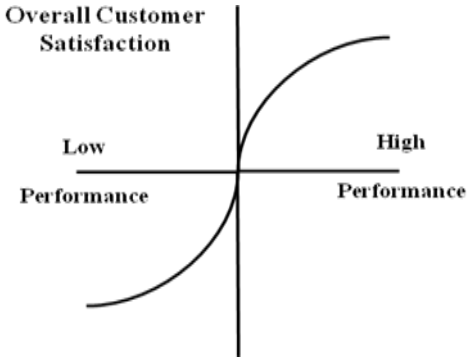
Source: (E. W. Anderson & Mittal, 2000)

In the majority customer satisfaction programs, the relationship between service attributes performance and customer satisfaction is taken linear and symmetric (Goodman, Fichman, Lerch, & Snyder, 1995). Though, there are some other studies that give details the non-linear and asymmetric relationships, For example, (V. Mittal & Baldasare, 1996) in wellbeing care; (Danaher, 1998) in aviation industry; (V. Mittal, Ross, & Baldasare, 1998) in automobile industry; (Bolton & Lemon, 1999) in leisure, and (Grisaffe & Kumar, 1998) in B-to-B marketing that explain the relationship between performance of service attributes and customer satisfaction.

Research shows that there is a major difference between the key drivers of customer satisfaction and dissatisfaction ((Shiba, 1993); (Dutka, 1993); (Gale & Wood, 1994); (Oliver, 1997)). As per two-factor theory of (Herzberg, Mausner, & Snyderman, 1959), job satisfaction factors can be categorized into two groups: “motivators” (increase job satisfaction) and “hygiene factors” (prevent dissatisfaction). Two-factor theory has also been taken in marketing theory, where multi-attribute models are used to understand the construct of customer satisfaction. These models enables that service attributes do not

have alike importance from customer viewpoint. While considering customer satisfaction, the effect of short attribute-level performance on overall satisfaction is larger than attributes with high performance (B. Mittal & Lassar, 1998). This relationship has explained through prospect theory (Kahneman & Tversky, 1979) which describes how individuals form decisions and respond to losses and gains, shown in **Figure 2.8.** Alternatively, further studies revealed the three-factor theory (E. W. Anderson & Mittal, 2000) (Matzler & Sauerwein, 2002). So, service and product attributes divided into three groups: basic, performance and exciting attributes (the three-factor theory). Initially the theory was developed by (Kano, Tsuji, Seraku, & Takerhashi, 1984)based on Herzberg's two-factor theory.

Figure 2.8 : S-Shaped Value Function In Prospect Theory

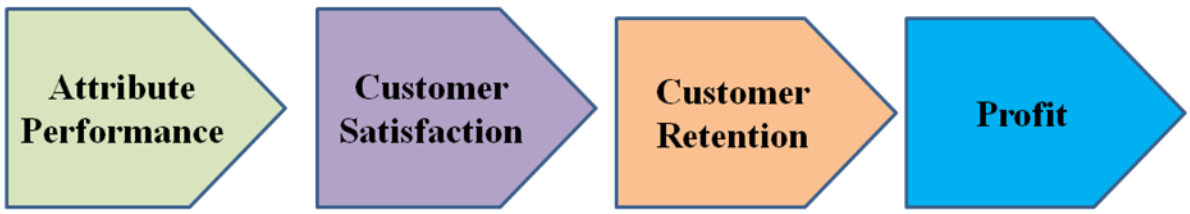


As stated by the service management literature, customer satisfaction is the outcome of a customer's perception of the service quality (Blanchard & Galloway, 1994) (Heskett, 1990) concerned to the expectation (V. A. Zeithaml, Parasuraman, & Berry, 1990). Besides, (Van Looy, Gemmel, & Dierdonck, 2003) defines customer satisfaction as:

"The customer's feeling regarding the gap between his or her expectations towards a company, product or service and the perceived performance of the company, product or service."

Together the service management and marketing literature propose that there is a strong positive relationship between customer satisfaction, customer behavioural intentions (e.g. switching and word-of-mouth) and, in turn, profitability(Yi & Zeithaml, 1990), shown in **Figure 2.9**. By basic improvement in product and service attributes performance, customer satisfaction level should increase (B. Mittal & Lassar, 1998) (Wittink & Bayer, 1994) which, further, lead to improved customer retention (V. A. Zeithaml et al., 1996) (E. W. Anderson et al., 1994) . Accordingly, enhanced customer retention generates more earnings (E. W. Anderson & Mittal, 2000). Despites it importance, there seems to be a few investigational research that quantifies the complex relationships.

Figure 2.9: The Satisfaction-Profit Chain

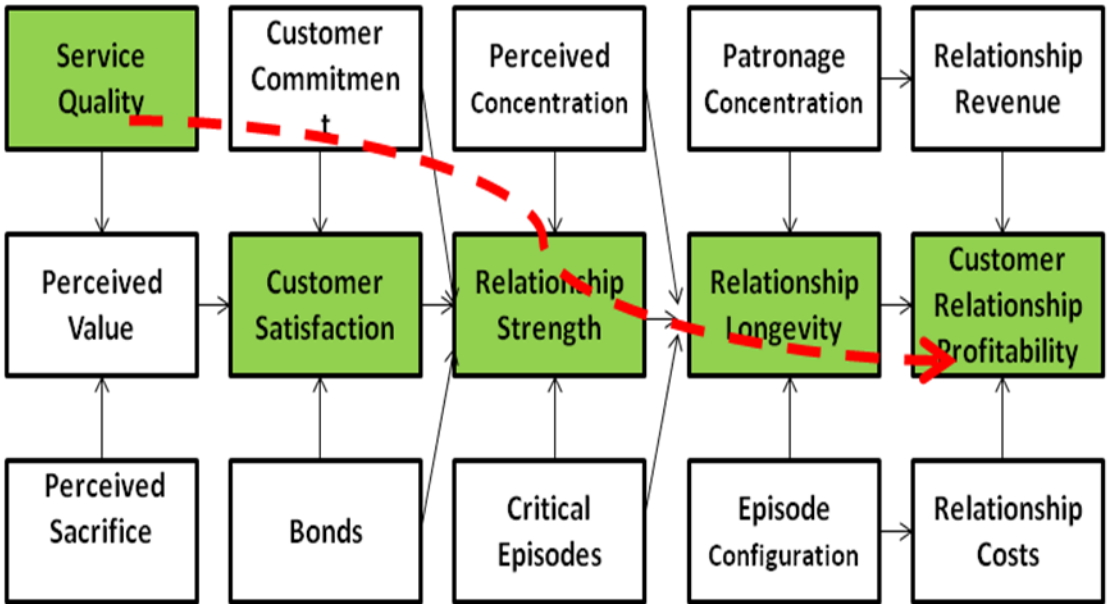


(Adopted from Anderson and Mittal 2000)

Customer satisfaction can be explained as an overall evaluation of service quality attributes or service attribute performance (Fornell, Johnson, Anderson, Cha, & Bryant, 1996)((Johnson & Fornell, 1991) (Boulding et al., 1993). Various studies discussed the relationship between two attributes of service quality performance and overall customer

satisfaction (E. W. Anderson & Sullivan, 1993) (Oliva, Oliver, & Bearden, 1995); (Oliver, 1993); (B. Mittal & Lassar, 1998). It is exposed that the relationship in most cases is nonlinear and asymmetric. More importantly, there is a strong relationship between customer satisfaction and customer future intentions and profitability(E. W. Anderson & Sullivan, 1993) (Bearden & Teel, 1983) (Boulding et al., 1993) (Oliver, 1980) (Yi & Zeithaml, 1990); (Caruana, 2002). **Figure 2.10** shows the relationship between service quality attributes and customer attitude and behaviour (Storbacka et al., 1994). Such complete approaches to model the customer relationship profitability are lacking, as the majority studies have only pay attention on separate aspects of the conceptual framework.

Figure 2.10: From Service Quality to Customer Relationship Profitability



Adopted form (Storbacka et al., 1994)

2.4 Customer Retention (CR)

Since commencement the subject of customer satisfaction and customer retention, and their relationship with companies' economical performance has become the centre of attention for many practitioners. By evaluating customer behaviour and changing accordingly , retention to profit, companies go closer to the inter-dependent variable – profitability (F. P. Reichheld & Sasser, 1990) (F. F. Reichheld & Schefter, 2000). Additionally, the marketing field has increasingly shifted from conventional approach to RM approach. **Table 2.4** shows the move from conventional marketing to relationship marketing. RM shows that existing and new customers require different strategies.

Table 2.4: Transaction Approach and Relationship Approach

Characteristics	Transactions focus	Relationships focus
Focus	Obtaining new customers	Customer retention
Orientation	Service features	Customer value
Timescale	Short	Long
Customer service	Little emphasis	High emphasis
Customer commitment	Limited	High
Customer contact	Limited	High
Quality	An operations concern	The concern of all

Adopted from (Peck & Jüttner, 2000)

Research in this segment shows that there is an asymmetric and non linear relationship between customer satisfaction and customer retention. Still, customer dissatisfaction may have a higher impact on retention than customer satisfaction. It should be renowned that different factors such as type of industry, market competition, switching expenses and risk factors may modify the relationship between customer

satisfaction and retention. Retention and defection are alike two sides a coin. Retention ratio can be given as the average probability that a buyer repurchases product and/or service from the same institution. The churning rate is explained as the average probability that a customer ports from one company to another.

Reducing customer switching rates can be lucrative to organizations. Research reveals that retaining customers is a more profitable strategy than acquisition of new customers (Fornell & Wernerfelt, 1987, 1988). Further, (F. P. Reichheld & Sasser, 1990) emphasis on nil customer churning as an overall performance:

"Ultimately, defections should be a key performance measure for senior management and a fundamental component of incentive systems. Managers should know the company's defection rate, what happens to profits when the rate moves up or down, and why defections occur." (p. 111)

The financial impact of customer retention calculations based on two main theories. First, adding new customers is more costly than retaining existing custom(E. W. Anderson & Sullivan, 1990); (F. P. Reichheld & Sasser, 1990). New customers are more likely to be unprofitable for a period of time after acquisition. Secondly, presents customers are more revenue generation, as it requires no advertising, promotion and start-up operating expenses (likely to generate more profit to companies through cross-selling and word-of-mouth. A study from(Rose, 1990) finds that a customer that retain with company minimum 10 years is on average three times more profitable than a customer with 5 years customer history.

2.5 Customer Loyalty (CL)

Managers use a broad range of terminology to illustrate loyalty and methods to measure it. In business customer retention, loyalty, and switching behaviour terms are used interchangeably. Other terms include: relationship strength (C. H. Lovelock et al., 1998) and perseverance commitment (Shemwell, Cronin, & Bullard, 1994). There is also a need of dissimilarity between measures of customer loyalty and related factors such as customer satisfaction. (Andreassen & Lindestad, 1998) explained loyalty as *"an intended behaviour caused by the service and operationalized loyalty as a repurchase intention and willingness to provide positive word-of-mouth".* Also, (F. P. Reichheld & Sasser, 1990) have also found customer satisfaction as a most important element in securing customer loyalty.

Customer loyalty was defined in service aspects and extensive marketing literature. The practitioners defines loyalty as the measures that can be seen in various forms such as relationship continuance up-selling, cross-selling and word of mouth or customer recommendation. This type of behaviour augments profitability through enhanced revenues, declining costs to add new customers and retained existing ones, and lesser customer-price sensitivity (F. P. Reichheld & Sasser, 1990); (Hallowell, 1996) . While marketing literature has explained customer loyalty into separate ways (Jacoby & Kyner, 1973). The first describes customer loyalty as an approach which indicates an individual's overall add-on to a product, service, or (Oliver, 1999). The other explains loyalty as intention that can be assessed in form of re-purchase, increasing the scale , word of mouth and scope of a relationship but the behavioural view of loyalty is same from point of view of both service management and marketing.

There is no agreement on the most suitable way to measure loyalty in spite of numerous studies on customer loyalty. Current studies in customer loyalty can be declared into three groups. These three groups are:

(1) Loyalty as repeat purchase and WOM behavior (Liljander & Strandvik, 1993)

(2) Loyalty as a mutual composite of repeat support and attitudinal component (Dick & Basu, 1994), and

(3) A psychological prospect of loyalty (Czepiel, 1990).

In the present study, customer loyalty is defined as customer word of mouth (WOM) behaviour. (Harrison-Walker, 2001) discuss that WOM is one of the major factors in acquiring new customers.

In spite of the benefits that result from WOM, many organizations can't yet develop relationship between the service quality-customer satisfactions to word of mouth. This is due to the fact that satisfaction plays as a bridging approach between service quality attributes and customer's WOM. The customer retention is not the identical as customer loyalty. Customer retention rate is measured on a period-by-period basis and it is used as a symbol of customer switching intention, while customer loyalty has a much strong abstract meaning. If a customer is loyal towards a service, he /she has a positive emotional disposition towards this service. Customers might carry on to purchase a particular brand but this may be merely out of convenience. Here, a customer can be retained, but not necessarily keep loyal.

2.6 Marketing Intelligence

The time has come for companies to develop and sustain long-term working relationship with their esteemed customers. For it, companies need a organized process of analyzing, collecting, supplying and applying information about the external market and internal environment. Thus, marketing intelligence plays a key role in the formulation of plans to achieve this aim(Y.-I. Lee & Trim, 2006). MI develops the decision-making procedure by offering external (e.g., customer needs) and inner data from the environment (e.g., employee loyalty). (Cornish, 1997) explained marketing intelligence as:

"The process of acquiring and analyzing information in order to understand the market (both existing and potential customers) to determine the current and future needs and preferences, attitudes and behaviour of the market; and to assess changes in the business environment that may affect the size and nature of the market in the future."

In fact, generally firms rely on approximations to assess the efficiency of their processes. Whereas, it is typical to make decision without objectives to get enhanced business performance. Therefore, the analytical result of customer value has attracted lots of attentions as a force for aggressive differentiation.

2.7 Costumers as Decision Makers

Customers are not concerned with the sum of profit companies making; they expect the companies to meet up their requirements. A customer pays attention about the quality of the relationship he has with the institution. According to (McDougall & Levesque, 2000),

"Relationships have become powerful differentiators." More prominently, customers want that firms should improve personal relationships with their customers.

The series of impact of the performance of service attributes on customer satisfaction, is, its result on customer retention and loyalty, leading to positive operating ratios(Rust & Zahorik, 1993)

. Alternatively, there is a need of studies exploring the relationship between customer perception and customer future intentions, length of association and WOM. Such work helps practitioners to judge customer migration, and assign resources accordingly.

Customer Value: In turn to apply long-term approach, the organization needs to know how the value of a customer develops over time. To achieve it, associated control actions must be put in place. Lifetime value is the wide term used to explain the long-term economic value of a customer. In simple way, customer value indicates the fact that each and every customer creates a value over his/her life span with a firm **(Figure 2.11).** But, the lifetime of a customer by itself needs convoluted modelling, as it involves forecast of the probability of retention. Importantly, the responses of the lifetime value

can alter subject to nature of product/service, data availability and analysis capability. (Reinartz et al., 2005). Therefore, the formulation can be adapted depending upon the type of industry and company attributes. For instance, contractual association such as mobile phone purchasing requires a different formulation in respect of non-contractual relationship such as the aviation industry.

Following are some important terms related to customer value:

- **Churn rate:** It is the % of customers who stop their relationship with a company in a defined period. Therefore, one minus the churn rate is the retention rate.
- **Discount Rate:** It is the price of resources used to offer discount future revenue from a customer.
- **Retention Cost**: It is the whole amount of money has to be exhausted in a given period to retain an existing customer.
- **Period:** It is the duration of customer relationship determined to be analyzed. Customer lifetime value is a multi-period dimensional calculation.
- **Periodic:** This income is the amount of revenue created by a customer in the pre determined period.
- **Profit Margin:** It is the difference in revenue and costs, even this may be reflected as a % of gross profit.

The marketing section should target the customer that has the highest likelihood to be profitable to the company using the logical result of customer value evaluation. The customer value-based system brings the following advantages to the company:

1. Increased rate of investment

2. Decrease in costs of products/services

3. Increase in acquisition and retention of profitable customers

2.8 Customer Segmentation

Due to increasing number of market competitors, decrease in customer switching costs and resulting customer retention, the competition to obtain more customers has worsen among firms. The firms need to establish their customers in order to generate the processes, capabilities and infrastructure to fulfil their demands. Without categorization, differences in customer needs might never be known.

CS is a method of defining customers into a number of smaller groups. This practice helps practitioners to denitrify the most profitable segments and to develop a proper strategy for charming and retaining high value customers. (Bounsaythip & Rinta-Runsala, 2001) proposes segmentation as:

"Customer segmentation is a term used to describe the process of dividing customers into homogeneous groups on the basis of shared or common attributes (habits, tastes, etc.)."

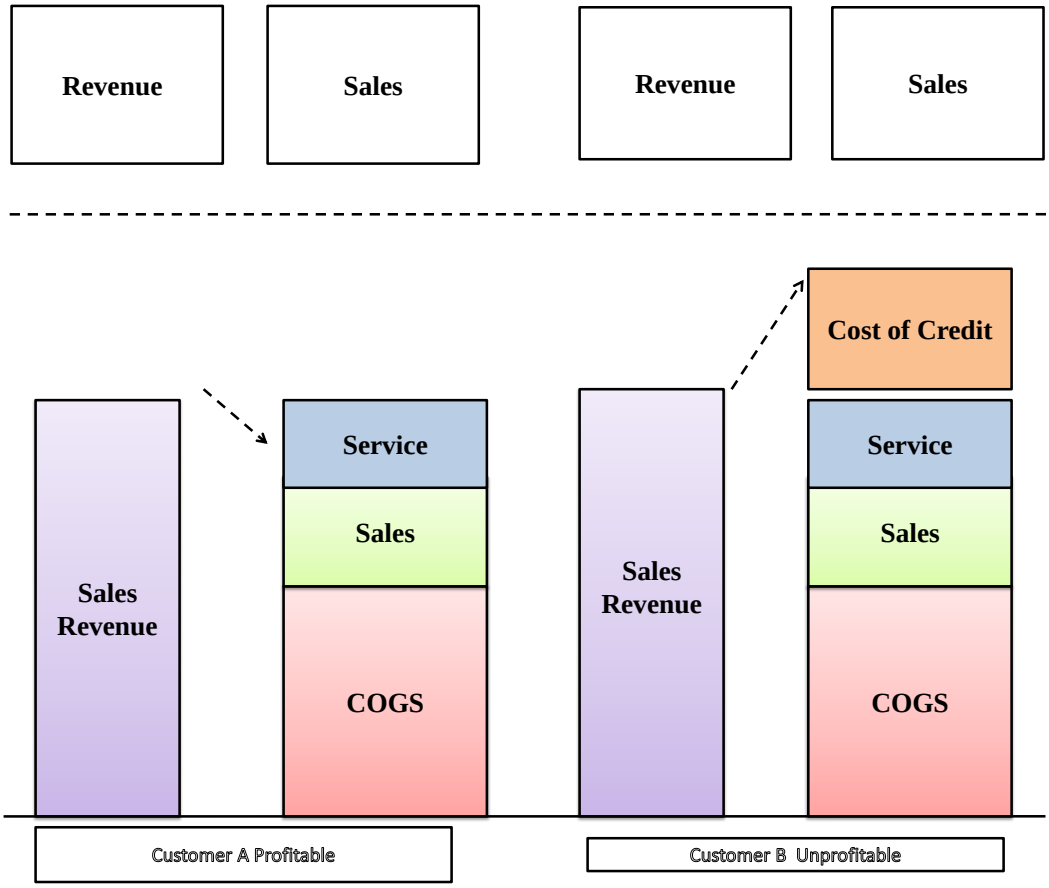
The requirements of a variety of customers in the current business environment cannot be satisfied by majority conventional marketing strategy (Yong Ahn et al., 2003). Segmentation theory shows differences in customers and markets into various clusters or groups with identical needs and distinctiveness that are expected to show similar behaviours. As a result, segmentation is a basic element for CRM system. (Kamakura & Wedel, 1997) shown segmentation parameters into two categories:

(1) The ordinary variables that comprise the customer demographics and lifestyles,

(2) Specific variables related to product e.g. customer purchasing, behaviours/intentions.

Customer segmentation (Hwang, Jung, & Suh, 2004) shows the process of categorizing customers into a variety of groups of customers. It enables analyzing the complete database in a single image, thus allowing a company to care customers in a different way according to rank and pursue marketing that is suitable to each class. Going in Detailing of customer profitability enables that there is not always a positive association between customer revenue and customers from a variety of customer segments which contribute in a different way on economic criterion. In particular, some customers fetch more returns to the firm than the others ones. **Figure 2.11** shows that there are two customers, A and B, they have the equal revenues but their sales amount is notably different. (Foster, Kesselman, & Tuecke, 2001) states that "each dollar of revenue does not contribute equally to net income".

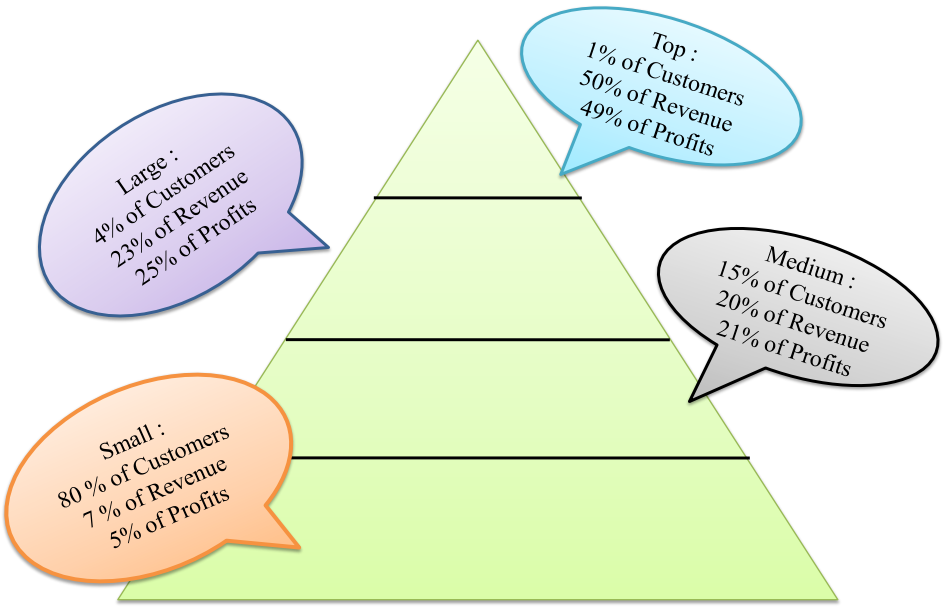
Figure 2.11: Costs and revenue relationship (Van Raaij, 2005)



(Gustafsson et al., 2005) cited that "while improving revenue for profitable clients does indeed improve profitability, exactly the opposite occurs for unprofitable clients". Accordingly, customer's revenue generation levels have a critical influence to net income. Further, Raajj (2005) interprets this dissimilarity by a pyramid segments base on their size, revenue and profit shown (in %). As a result, customer segmentation can be defined as a way to priorities customers by their value, to the institution. For illustration, in some scenarios, a little percentage of customers brings the most of the profit to the institution. A study from Banc One of Columbus, Ohio, reveals that 20 % of their customers fetch all of the bank's earnings, while the rest, 80%, only cost money (Oviatt

& McDougall, 1997). So, different segments should be approached by different planning's (Elsner, Krafft, & Huchzermeier, 2004).

Figure 2.12: A Customer Pyramid with Four Revenue Tiers



2.9 Costumer Activity Measurement

Customer behaviours are insignificant unless we converted it into a computable unit. Companies have strategies to balance the cost of a plan against the service quality (e.g., reduced waiting in the customer care) in its place of measuring the cost against the increase in, e.g. customer satisfaction. The complexity is that, while appearing to be impartially significant, some benefits may have only a fractional effect on customer behaviour. Apart from a company realizes the cost versus benefits of increased customer results, the effort to execute a new strategy like new findings may be a waste of capital. More enthrallingly there is evidence in the literature that there have been efforts to illustrate the relationship between

these constructs, yet, these explanations are by no means fully recognized (Moutinho & Smith, 2000). It is well established that the association between customer behaviours and profitability is not nearly as simple as regularly proposed. Thus, this study targets to deliver an objective means to clarify the relationship between various service quality attributes and customer satisfaction.

2.10 Previous Studies on Customer Satisfaction in Mobile Telecom Industry

Numerous studies have been carried out to discover the determinants, importance, and consequences of customer satisfaction in the mobile telecommunication industry worldwide. Some of these studies are explained in brief here:

Study in Bangladesh:

In a study carried out by (Akbar & Parvez, 2009)

in Bangladesh on 304 customers of different telecom operators, it was established that the trust and customer satisfaction are considerably and positively related to customer loyalty. Customer satisfaction was found an important moderator between perceived service quality and customer loyalty.

Study in South Korea:

In another study, in South Korea, conducted on 283 subscribers to find main Moderators Influencing the Relationships of Customer Satisfaction, Service Quality, and Customer Loyalty(H. S. Lee, 2013), outcome revealed that service quality and customer satisfaction positively affect customer loyalty. Besides, service quality positively affects customer satisfaction. That's why; customers having superior perceived service quality and satisfaction also have strong loyalty. Moreover, the study verified the fact that

moderating variables positively influence the relationships among the abovementioned factors. The effect of service quality on customer satisfaction increases, among customers with a higher level of perceived value. When customers' perception of realistic price rises in upward direction, the impact of service quality on customer satisfaction rises too. Finally, the study revealed that as perceived switching cost increases, the relationship between satisfaction and customer loyalty strengthens in results.

Study in Thailand

(Leelakulthanit & Hongcharu, 2011) examined the determinants of customer satisfaction by interviewing 400 mobile phone users in Thailand. Both the researchers found that promotional value, quality of customer service at shops and corporate image are responsible in determining customer satisfaction. Similarly, (Alom, Khan, & Uddin, 2010) examined 60 university students in Bangladesh who were also using mobile phone services, to distinguish the determinant factors in selecting mobile service providers. Consequences of that study focused on two factors: perceived call rate and brand image, to have the most control on the consumers' selection decision of a telecom mobile service provider in Bangladesh.

Study in Netherlands:

(Bügel et al., 2010) analyzed promise made by firms, in Netherlands, applying the psychological investment model. The study investigated the company- customer relationships in five sectors: supermarkets, the banking industry, health insurance, auto industry and the mobile telecom providers. The study analyzed 300 respondents for each

sector. The result of the study, regarding satisfaction, enables that satisfaction plays an imperative role in shaping customer commitment for service providing firms and there is a positive correlation between improving customer satisfaction and enhanced customer loyalty.

Study in Pakistan and Ghana:

In Pakistan (Jahanzeb et al., 2011) examined customer loyalty in the telecommunication industry, using 146 cell phone users. The study recognized that customer loyalty is created mainly by: service quality, trust , switching cost and staff loyalty. The results of this study show approval, in part, with a study by (Boohene & Agyapong, 2011)

of 460 clients of Vodafone in Ghana. This study pointed out that satisfaction does not necessarily lead to loyalty, while service quality was found to be strongly and positively associated with loyalty. In contrast, it can be seen from the findings of this study that customer satisfaction is initially built into service quality. Customers distinguish service quality positively if they are pleased with the service provider and with the services offered to them.

Study in Pakistan:

(Hafeez & Hasnu, 2010) who explored customer satisfaction in Pakistan, showed significance of service quality and price in determining customer satisfaction. The same was established by (Balaji, 2009). He studied the past history and consequences of customer satisfaction with Indian mobile telecom services, after surveying 199 post-paid mobile subscribers in a big city in India. Further Balaji reported that “perceived quality is

an important predictor of customer satisfaction, which ultimately results in trust, price tolerance and customer loyalty".

Study in Pakistan:

Nevertheless, students with high income were found to be less loyal, less satisfied and more probable al switch both mobile phone and credit card services. Using 331 university students with SMS facility of any cellular company in Pakistan; (Ahmed et al., 2010) studied customer retention through the quality of SMS. The results point out that service quality has a considerable relationship to customer retention.

From all the above studies discussed in brief, it can be concluded that customer satisfaction has a straight effect on the financial performance of a company (Ittner & Larcker, 1998) (Smith & Wright, 2004). If companies want less customer switching, more loyalty, less price sensitivity, and positive word-of-mouth advertising, then service quality needs to be improved up to the desired level of customers wants(M.-K. Kim et al., 2004) (Homburg & Giering, 2001); (Garvin, 1988).

Study in Malaysia and India:

In Malaysia , the significance of service quality in deciding a mobile phone operator was also studied by (Rahman et al., 2011). He carried out a study of 400 mobile telecom customers from main cities of Malaysia. This study revealed that network quality is one of the important factors in overall service quality. Moreover, to service quality, the study found that price plays a major role in the selection for mobile operators in Malaysia. Such type of findings is not away from the conclusion of a study carried out by **(Das Gupta &**

Sharma, 2009) in India. Both the researchers explained that to retain customers and attract fresh customers, mobile operators must offer "services with reasonable quality lacking any hidden price**.**

Study in Nigeria:

In a study conducted by (Oyeniyi & Abiodun, 2011)on 148 subscribers of major telecom companies in Nigeria, the consequence of service quality on customer satisfaction was recognized. They established that service quality has a positive impact on satisfaction and loyalty. Such a positive relationship between service quality and satisfaction is supported by a number of studies, e.g. (Sureshchandar, Rajendran, & Anantharaman, 2003); (Brady & Cronin Jr, 2001)& (Cronin, Brady, & Hult, 2000) ; (Caruana, Money, & Berthon, 2000) ; (Negi, 2009) ; (Agyapong, 2011). Now the question comes: How customers evaluate service quality in mobile industry? The reply to such type of vital question can be obtained by going through the study by (Boohene & Agyapong, 2011) who states that "due to the fact that telecom companies do not provide tangible products, their service quality is usually determined by measure of the service provider's relationship with customers". Accordingly, practitioners should pay attention to develop skill profession of staff and offering quick and proficient services."(Eshghi et al., 2008) recruited 238 mobile phone users in four big cities of India to recognize the impact of service-related factors on repurchase intention, customer satisfaction and the recommendation/WOM of a service to others. They established that "the most significant predictors of customer satisfaction are: relational quality, competitiveness, reputation, reliability, support features and transmission quality". Other studies established that customer satisfaction in

telecom industry is based on factors like coverage, voice call quality and the customer complaint solving process(M.-K. Kim, Park, & Jeong, 2004). An imperative consequence of customer satisfaction might be customer retention. Companies will not be able to keep their customers without satisfying them. In mobile industry, customer retention enables the achievement and continued existence of mobile service providers(Wong, 2010) (V. Mittal & Kamakura, 2001) (Leelakulthanit & Hongcharu, 2011).This might be because of brutal competition, the more cost of adding new customers and the resemblance type of services offered by the operators (Neslin, Gupta, Kamakura, Lu, & Mason, 2006) (H.-S. Kim & Yoon, 2004) (Gerpott, Rams, & Schindler, 2001).

Study in Canada:

In this respect, (Wong, 2010) conducted study using a billing records of 1403 Canadian post-paid mobile customers over 3.7-year study period. Wong found that better loyalty, thus retention, is observed in customers with most favourable rate plans than those with non-optimal ones. This shows that in order to minimize churn rates ; mobile service providers must search for efficient customer withholding strategies.

Study in Iran:

The most important churn determinants were found to be the displeasure of customers on pricing issues (Wong, 2009) (M.-K. Kim et al., 2004) (Ahn, Han, & Lee, 2006). (Fazlzadeh, Ghaderi, Khodadadi, & Nezhad, 2011) undertake study of customer retention on the dimension of loyalty. They examined the relations among service quality, satisfaction, corporate image and loyalty in Iran. Data were collected from 417

customers of an Iran mobile telecom service provider. Study outcome exposed that customer satisfaction plays a significant mediating role in relationships in forming corporate image, service quality and perceived value to loyalty. Faithful customers are liable to remain longer with associated service providers. In this regard (Siddiqi, 2011) explains that personal distances might play a vital role in consumer loyalty, customer satisfaction and retention. To confirm his argument, (Siddiqi, 2011) studied 500 university students having mobile phones and credit cards. The conclusion of this study revealed that age, gender and income gap affect customers' satisfaction, loyalty, and retention. For instance, women are established to be more loyal, more satisfied and less likely than men to change mobile phone services. Similar results were found for youth both mobile phone and credit card users.

2.11 Chapter Conclusion

The chapter review major concepts of customer satisfaction, what customer wants from a service provider, what are his expectations. Onwards the topic analyzed the Expectancy confirmation Model of Customer Satisfaction to explain that how expectations and performance form disconfirmation and satisfaction. Then, it was studied that how customer satisfaction changes behavioural intentions of customers. The relationship of customer satisfaction with behavioural intention, perceived vale and service quality was studied. Literature review regarding relationship marketing and its relationship with customer satisfaction was also conducted. It was observed that CRM (Customer Relationship Management) is the key factor in satisfactory delivery of services.

The chapter also throws light on Customer Satisfaction-Retention-Loyalty Chain (SRLC). Which shows that how satisfied customer are assets for any organization. Some studies show that it costs six times higher to attract a new customer than retaining existing customer. Therefore organizations should give due importance to retain the existing customer while attracting new customers. It also provides direction to managers concerned that how important is to keep long-term relationship with existing customers.

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Chapter -III

Service Quality

3.1 Relevance of Quality

"Quality is never an accident; it is always the result of intelligent effort"

John Ruskin (1819-1900)

This quote by Ruskin unambiguously demonstrates us of the significance of quality - in the society in general term and the business place specially. Though purchase intentions are still broadly described by price, quality variables such as consistency and capability as well as reputation and communication are thought to become more and more important. As both end-users and institutional subscribers are no longer satisfied by average quality products and services (Christopher, Payne, & Ballantyne, 1991) , quality management philosophy has changed from an extracurricular activity to an essential requirement (Caruana, 2002). As per (Townsend, 2005)

The discussions has diverted away from 'quality costs money' towards 'quality makes money'. While taking into account quality, it is not only essential to realize that quality and profit is not dependant to each other at all, but also that quality has become a key parameter to survive in an ever increasing competitive market scenario. Juran stated Institute "To survive in today's environment of global competition, never-ending change and complexity, rising customer expectations and continuous cost pressures, focusing on quality is no longer a choice; it is mandatory".

While quality is considered as essential to corporate accomplishment (Devlin & Dong, 1994) , it is required to be able to measure it before being able to suitably manage it

(Drucker, 1995). As a result, a clear definition of quality is desirable. On the other hand, sufficient and usually shared definitions of quality are hardly ever found within both academic and commercial areas.

It is famous quote of John Ruskin Fodder supplemented to this famous quote that **"Quality is never an accident; it is always the result of high intention, sincere effort, intelligent direction and skilful execution"** .While this quote may explain the considerate nature of quality, it is also implicit that quality is indefinable and multifarious – in concept and definition, in production and delivery as well as in measurement and management. This is again complex when analyzing the quality while considering to service operations, particularly in a business-to-business environment.

"It is not enough to do your best; you must know what to do, and then do your best."

W. Edwards Deming (1900-1993)

Further father of quality system W. Edwards Deming focused on the function of management in targeting quality. Deming noted that around 15% of poor quality was due to workers, and improper management, bad systems and processes were responsible for the rest of 85% . According to Deming, administration should engage employees in solving the problems, not merely to blame them for poor quality. Deming's 14 principles are explained as below:

- Create constancy of purpose (short term actions has to be replaced by long-term planning goals),
- Take on the new philosophy (management should follow this philosophy, instead to expect the employees to do that),

- Stop dependence on examination (it concerns to variation – or we can say, if there is no deviation, no inspection is required because all products shows no defects),
- Shift towards a one supplier for every item
- Get better continually and evermore (it refers to decreasing variation, as a key to better quality),
- Provide institute training on the job (lack of training of workers; train properly them to do a particular job.
- Develop institute leadership (distinction between leadership and supervising),
- Facilitate drive out fear (Get rid of fear at worker's level to get their support for betterments.)
- Try to stop barriers between departments
- Get rid of slogans (usually, it's not the subordinate who did it incorrect, but it's the organization who authorized that to do so. It is not required to make tension on worker, as long as the system fails to put off problems),
- Get rid of management by objectives (So long as workers had to attain an recognized production level, quality will be a another target),
- Eliminate hurdles to pride of workmanship (bringing problems all the time to worker's ears, will produce a uneasiness for them. Reduced satisfaction levels of workers equals a lower interest for performing good items),
- Facilitate for institute education and self – improvement (Providing education is a benefit. Everybody has to get better)
- Makeover is everyone's job (improvements is possible at every level and always).

The most important book talked about he wrote among other is **"Out of the Crisis"** in 1987. What is pertinent to this book along these 14 principles is that Deming started the movement toward TQM; even he didn't use this philosophy.

3.2 Quality in Service Operations

"Quality is ballet, not hockey" Philip B. Crosby (1926-2001)

This quote by Crosby may assist to distinguish services from products with reference to quality. Alike to hockey game, where one can't think of measure the final score of a match, product quality can be evaluated against re-determined stipulation. Alike to ballet, where quality is much more in the judgment of the audience, service quality can be rely upon customer perceptions (Zeithaml, Parasuraman, & Berry, 1990) (Grönroos, 2000) . Consequently, it is not shocking that quality actions for product manufacturing are extensively understood and used, while quality measures precise for service operations have urbanized more slowly (Mills, Chase, & Margulies, 1983) . This slower progress has been mainly credited to intangibility (e.g. (Regan, 1963) , (Drucker, 1995), (Anantharanthan Parasuraman, Zeithaml, & Berry, 1985), labour intensity (Flipo, 1988) and difficulty (Schmenner, 1986). Ignoring these parameters, quality management in the services sector has for too long been controlled by the logic of manufacturing. While comparing quality between service operations and manufacturing, one of the basic claims has been that mainly the complication of service operations demands a additional holistic approach including a customer-orientation to quality (Anantharanthan Parasuraman et al., 1985), (Grönroos, 2000).The management of quality is again complex when considering quality in a B to B environment - for the plain reason that additional stakeholders are involved in the delivery process.

3.3 Service

Service is considered to be intangible Compared with substantial products, it is heterogeneous, unable to be kept in stock , produced and consumed at the same time, A broadly accepted definition of service is projected by (Grönroos, 2000) as: **"A service is a process consisting of a series of more or less intangible activities that normally, but not necessarily always, takes place in interactions between the customer and service employees and/or physical resources or goods and/or systems of the service provider, which are provided as solutions to customer problems. "** This definition showed that service is a process where communications between customer and service provider generally stay alive. Therefore, from a service point of view, there is always a association between customer and service provider; such association can be used as a tool for marketing. Therefore to keep loyal customers associated with firm, who will bring profit to the firm, the major concern for service provider is to enable this relationship in the way it manages customers by delivering what customers' want and needs. The quality of a service is instinctively perceived by customers during the communications with a firm.

(Arun Parasuraman, Zeithaml, & Berry, 1988) described service quality as the **"Consumers' judgment about a firm's overall excellence or superiority"**. Everything perceived by customers in the communication process will have critical impact on customers' judgment of service quality (Grönroos, 2000). Because of the special attributes of service, the assessment of service quality is more multifaceted than assessment of product quality. There have been a variety of ways for measurements of service quality proposed by preceding literatures and researches. The well-known

measurement model of service quality is “SERVQUAL” proposed by (Arun Parasuraman et al., 1988) , they measured the gap between customer expectations and perceptions based on five determinants: **Tangibles**, **Reliability, Responsiveness ,Assurance and Empathy.**

3.3.1 Determinants of Service

As per (Anantharanthan Parasuraman et al., 1985), earlier definitions of service quality was relied upon the called **“disconfirmation”** model which deals with a perception of service quality which is a result of a assessment between what consumers think that the service should be and their thoughts about the real performance offered by the service provider. Since then, a lot of researches have been carried out on this subject, mainly due to its role as an input to customer satisfaction (Oliver, 1996) and an pointer of organizational performance (Lewis & Mitchell, 1990). The fresh literatures proposes that service quality is the customer’s subjective appraisal of service performance (Cronin Jr & Taylor, 1992).

Service quality is also taken as the customer’s feeling of the relative poor standard or superiority of a service provider and its services (Bitner & Hubbert, 1994)(Tsoukatos & Rand, 2006).A perfect example of a standardized framework for understanding service quality is the SERVQUAL model proposed by (Arun Parasuraman et al., 1988).

This model considers reliability, assurance, responsiveness, empathy, and tangibles. Reliability shows to the ability to perform the committed service accurately.

Responsiveness shows to the willingness to help customer and provide prompt service. Assurance shows to the employees’ acquaintance and courtesy, and their ability to motivate trust and confidence. Tangible characteristics means to look at physical

facilities, equipments, personnel and written materials. Johnson and (Johnson & Sirikit, 2002) proposed the telecommunication industry service quality assessment and the items are as follows (See **Table 3.1**):

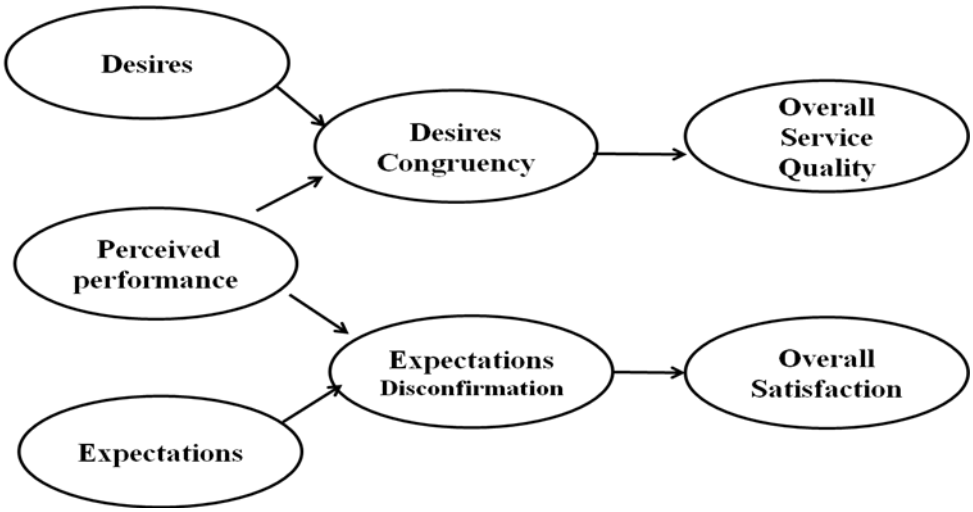
Table 3.1. The Telecommunication Industry Service Quality Assessment and the Items

Dimensions of Service Quality	Items
Tangible	A service provider has modern apparatus.
	A service provider's substantial amenities are visually attractive.
	A service provider's CCE(Customer Care Executive) are well clothed and appear neat.
	The look of the physical amenities of the firm is keeping with the type of telecom service.
Reliability	When a service provider promises to do something by a assured time, it does so.
	When someone has problems, a service provider is concerned and comforting.
	A service provider is reliable.
	A service provider delivers its service at the time it commits to do so.
	A service provider keeps its account precisely.
	A service provider does tell customer exactly when service will be performed.
Responsiveness	I do receive prompt service from CCE.
	CCE are not always willing to help customers.
	CCE are too busy to respond to customer requests promptly.
Assurance	I can trust customer service staffs.
	I feel safe in your transactions with customer service staffs.
	Customer service staffs are polite.
Assurance	Customer service staffs get an adequate support from a service provider to do their job well.
Empathy	A service provider does not give me individual attention.
	CCE do not give me personal attention.
	CCE do not know what my needs are.
	A service provider does not have my best interests at heart.

3.4 The Relationship between Service Quality and Customer Satisfaction

(Oliver, 1993) first showed that service quality would be priority of customer satisfaction, until now, there are already some other researchers who have established the empirical support for the view point explained above (Anderson & Sullivan, 1993) (Anderson, Fornell, & Lehmann, 1994) ; (Fornell, Johnson, Anderson, Cha, & Bryant, 1996) (Spreng & Mackoy, 1996) , and customer satisfaction is a result of service quality. Service quality should be improved by raising expectations and be positively related to consumer satisfaction (Fornell et al., 1996) . In the present, various studies also have confirmed that service quality strongly drives satisfaction (Grönroos, 2001)((Kotler & Keller, 2006) (Oliver, 1980) (Wang & Lo, 2002). The (Oliver, 1993) 's Satisfaction Service Quality Model is shown in **Fig 3.1**

Figure 3.1 The Oliver's (1993) Satisfaction Service Quality Model



Source: (Oliver, 1993)

The search for a measurement tool of service quality relies on the backbone of service quality presumption (Grönroos, 1982) & (Anantharanthan Parasuraman et al., 1985). This research is pillared on the consumer behavior theory developed by Howard and from the (Howard & Sheth, 1969) model, quality is precursor to satisfaction, but quite a few firms do not offer service quality that fulfills customers' needs which results in customer gaps. The Gap-model given by (Arun Parasuraman et al., 1988) presents the service practitioners quandary as that of not knowing what customers want from the firm. The search for a standard tool of measuring service quality and customer satisfaction has given rise to development of two major models, SERVQUAL model and Service Performance (SERVPEF) model. In spite of the global use of the SERVQUAL model, its dimensionality and using in operation is uncertain. The SERVPERF models thoughts have developed a performance based measure and demonstrate it over the disconfirmation model(Carman, 1990) (Cronin Jr & Taylor, 1992) . Inadequate empirical literature is available on the use of performance based models in Indian telecom industry. The SERVQUAL model has five dimensions, (Sureshchandar, Rajendran, & Anantharaman, 2002) further the dimensions of service quality divided into two factors and introduced three additional dimensions; core service, non-human elements and corporate social responsibility.

This study thus projected an assessment of an improved four factor service quality construct as antecedent to customer satisfaction. (Kang & James, 2004) developed image as a moderating variable between functional qualities, technical qualities and perceived service quality. Likewise, driven by a performance based measure,

(Chen & Ting, 2002) combined the dimension of service quality into two attributes; technical qualities and functional qualities and associated them to customer satisfaction. The dimensions of service quality in mobile telecom framework differ from one operator to another, from one nation to another nation and even from one civilization to another, posing a suitable argument. In Indian context, the fast expansion of telecom sector enabled to poor conditions and degraded quality of telecom sector w.r.t. Network quality and call drops, over charging than promised tariff, poor customer care services, activation of unwanted VAS and network coverage problem. Due to such situation, the sustainability of service quality and customer satisfaction in telecommunication sector in India has become doubtful and worse. On the basis of the study background and developing issues on the relationship between service quality, corporate image and customer satisfaction,, knowledge gaps were recognized. Major of them was that while previous studies investigated the three variables in separation or in pairs, this study followed an integrated approach and required to establish the influence of service quality on customer's satisfaction.

The study wanted answers to the research question, 'what was the nature of relationship between service quality and customer satisfaction amongst telecom operators of India.

The always changing nature of service, give rise in service differences between service giving institutions. (Anantharanthan Parasuraman et al., 1985) developed the gap model that explains why customers experience quality differential. In a successive study, (Arun Parasuraman et al., 1988) gave the definition; **"Service quality is the degree of discrepancy between customers' normative expectations for the service and their perceptions of the service performance"**. They used this conceptualization in the

construction of 22 item scale tool (SERVQUAL model) .The SERVQUAL tool has since been extensively used as a tool for measuring service quality and customer satisfaction. (Sureshchandar et al., 2002) acknowledges SERVQUAL forms the cornerstone along which all other works have been produced.

The previous researches on customers' satisfaction in traditional areas, (Oliver, 1980)projected the theory of **"expectation inconformity"**, that is the customers will feel satisfied when the services actual performances are ahead of their anticipation. Alternatively, when the services actual performances are beneath their anticipation, customers will feel displeased. During the last decade, satisfaction has been taken as one of the most significant theoretical as well as sensible issues for most service organizations and customer researchers. (Kotler & Keller, 2006) projected that, **''Satisfaction is a personal feeling of satisfaction or dissatisfaction resulting from comparing service performances in relation to his or her expectation.''**

3.5 Service Quality Measurement Models

The foremost objective of this argument is to critically analyze and assess the value of important service quality models and to recognize the relationship between them on the basis of an in depth analysis of literature.

3.5.1 Grönroos Model

In a row with the disconfirmation paradigm, (Grönroos, 1984) gave a model in which he argued that consumers evaluate the service as experienced with the service as predictable in evaluating service quality. The model given by Grönroos pursuits to understand, how the quality of a given service is perceived by customers. In addition, it separates the customer's experience of any service into two horizons**:** technical quality

(what the consumer gets or the technical result of the service delivery process) and functional quality (how the consumer gets that technical outcome). Grönroos proposed that, in the framework of services, functional quality is usually perceived to be more significant than technical quality, considering that the service is provided at a technically acceptable level. The relevant diagram is shown in **Fig 3.2**

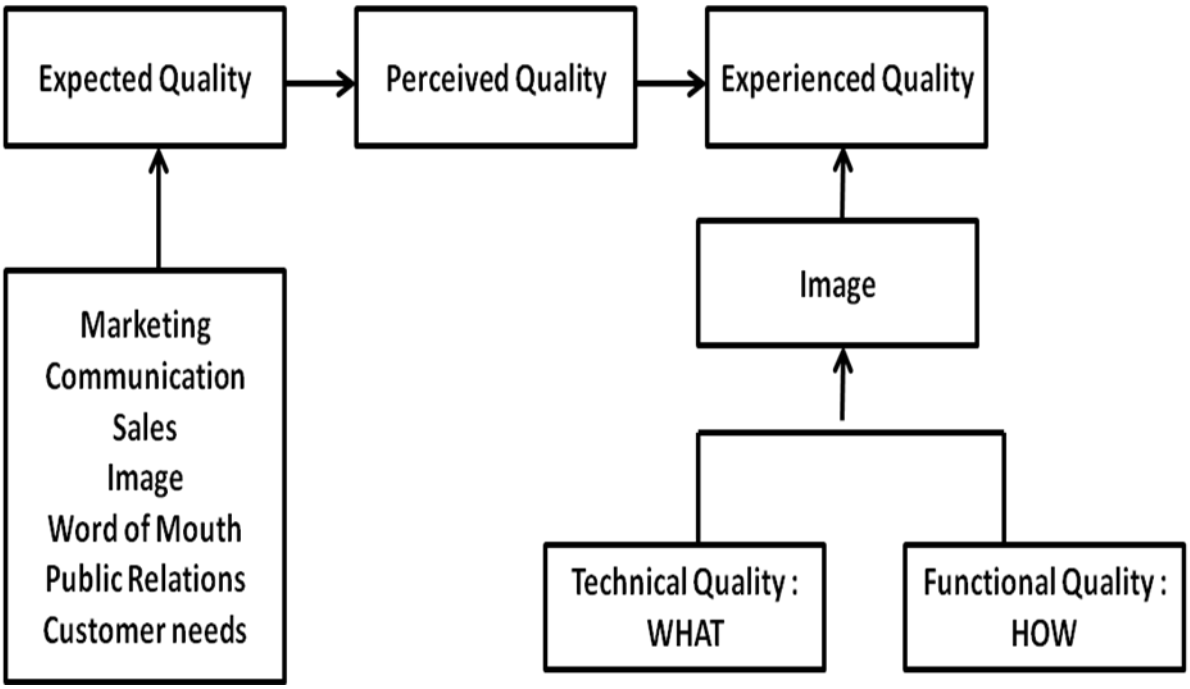


Fig 3.2 : Service Quality Model (Grönroos, 1984)

Later on exploratory research by (Anantharanthan Parasuraman et al., 1985) exposed several insights and propositions concerning consumers' perceptions of service quality. They suggest a more detailed service quality model including different service quality pillars based on an explanation of qualitative data achieved through a number of in-depth executive interviews and focus group discussions in four dissimilar service areas

(retail banking, securities, credit card, brokerage and product repair and maintenance). The detailed executive interviews exposed four **'gaps'** on the service provider's side that are likely to affect service quality as perceived by subscribers. A fifth gap, depending on the description of the first four gaps, was recognized on the consumer's side. The main insights achieved through the interviews suggest a theoretical **'SQ Model'**; also known as the **Gap-Model.**

3.5.2 SERVQUAL Model

At the outset, by (Anantharanthan Parasuraman et al., 1985) recognized a need to investigate the role of service quality in areas not generally for researchers to think broadly about discoverable issues and to be willing classified as operations, finance or marketing. They stated that "a need exists for research in the area of services to enter a new phase of empirical work that integrates various disciplines and various service industries" (p. 44).

Parasuraman et. al, proposed a theoretical model of service quality where they discovered five gaps that could affect the consumer's assessment of service quality in four dissimilar industries (retail banking, securities brokerage, credit card, securities brokerage and product repair and maintenance). These gaps were identified as;

Gap- 1: Consumer expectation - Management perception gap;

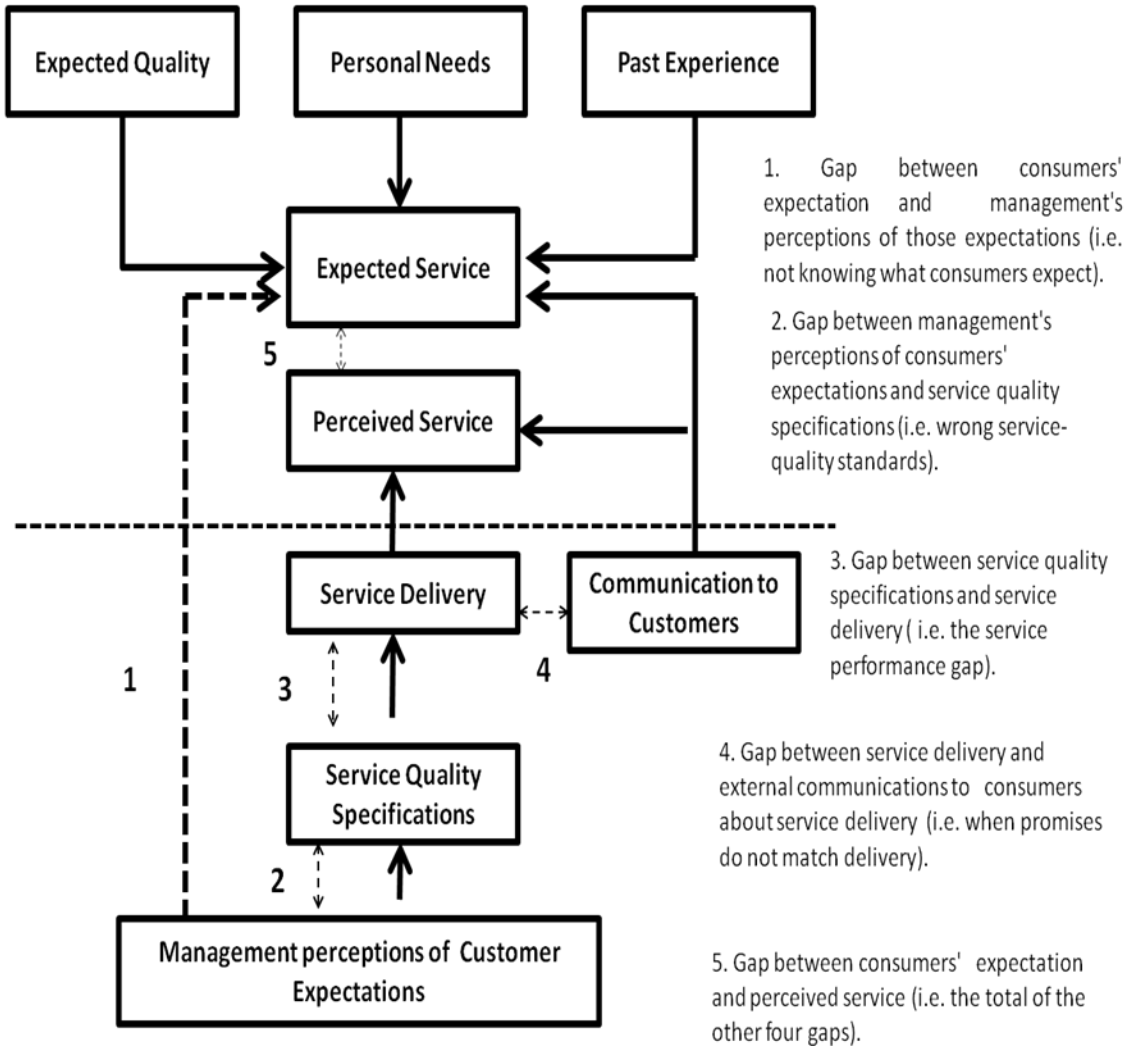
Gap- 2: Management perception - Service quality specification gap;

Gap -3: Service quality specifications – Service delivery gap;

Gap -4: Service delivery – External communications gap;

Gap -5: Expected Service – Perceived service gap;

Fig 3.3 SERVQUAL Model



Since the degree and direction of the fifth 'gap' influences the service quality in straight way as noticed by the consumer, it is taken as the most important gap. Pillared by the focus group discussions, (Anantharanthan Parasuraman et al., 1985) have idea of high service quality to the extent that their prospect are lower than the perceived service performance. If the opposite were true, customers would take the concept that the solution to ensuring good service quality is meeting or exceeding consumers' expectations.

The focus group discussions also discovered that, in spite of the type of service, customers use similar benchmark in developing expectations about and perceptions of services. These benchmarks seem to fall into ten classes, labelled as 'service quality determinants': reliability, responsiveness, competence, security, access, communication, understanding, courtesy, credibility, and tangibles. For each element, examples of service specific criteria were given.

3.5.3 SERVPREF Model

Cronin and Taylor (1992) do not support the framework of Parasuraman, Zeithaml and Berry (1985, 1988) in their empirical work, with respect to conceptualization and measurement of service quality, and developed a performance-based measure of service quality called 'SERVPERF' exhibiting that service quality is a form of consumer attitude (**Fig 3.4**). They contended that SERVPERF was an improved means of measuring the service quality construct. Their framework was afterwards mirrored and results suggested that there is little theoretical evidence supports the relevance of the E-P= quality gap; as the basis for measuring service quality. Again utmost criticism found against SERVQUAL scale, Cronin and Taylor (1992) gave theoretical evidences across four sectors viz. fast food, dry cleaning ,pest control and banking to support the superiority of their 'performance only' scale over SERVQUAL scale keeping the same items as had been projected by the Parasuraman, Zeithaml and Berry (1988). In equation form, SERVPERF service quality can be expressed as

$$KQi = \sum_{J=1} Pij$$

SQ =Perceived Service Quality

k= Number of Attributes/Items

p= Perception of individual "i" with respect to performance of a service firm on attribute "j"

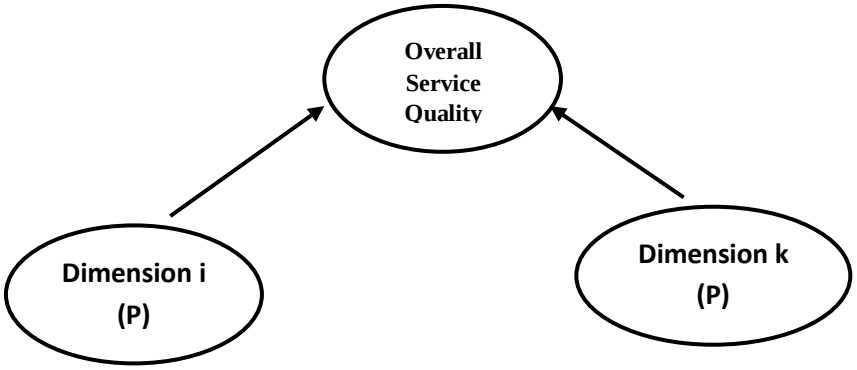


Figure 3.4 : Performance Only Model (SERVPERF)

Source: (Martinez & Martinez, 2010)

3.5.4 Inside about SERVQUAL and SERVPERF

The SERVQUAL versus SERVPERF argue is continuing as both groups of researchers have presented additional arguments to support their respective perspectives (Arun Parasuraman, Zeithaml, & Berry, 1994) , (Shemwell, Cronin, & Bullard, 1994).

The main arguments in favour of SERVQUAL by Parasuraman et al. (1994) are:

- There is important theoretical and empirical research to sustain their perception-expectation gap theory.
- The SERVQUAL tool is developed to measure perceived service quality at a given point in time (i.e. the attitude level), in spite of the development by which it was formed.
- SERVQUAL's concurrent and discriminate validity is as good as SERVPERF's validity.

The major arguments in favour of SERVPERF by Cronin and Taylor (1994) are:

The SERFPERF theory shows just one of a number of current challenges to the SERVQUAL conceptualization of service quality (Carman 1990, (Babakus & Boller, 1992) , (Rust & Oliver, 1993)

- SERVQUAL tool based on disconfirmation- is not evaluating service quality, but it appears at best an operational form of only one of the many forms of expectancy-disconfirmation (Boulding, Kalra, Staelin, & Zeithaml, 1993) , (Rust & Oliver, 1993) .
- Better construct validity has been observed with SERFPERF , when measured side by side to SERVQUAL based on a review of the accessible literature and the detail that SERFPERF evaluates also show convergent and is discriminate validity.

To conclude, Cronin and Taylor (1994) argued that since perceptions-minus-expectations evaluations seem to have small theoretical and experiential support, the genuine question that should be asked is whether or not perceptions only evaluates can effectively measure service quality. Based the literature and their own observed findings; they persist that the SERVPERF tool can supply a reliable and valid tool for measuring levels of service quality.

3.6 Construct of Service Quality

A service indicates to any activity that one party offers to another which is basically intangible and through some form of exchange satisfies an known need (Zeithaml, Bitner, & Gremler, 2006) . Service quality is measured by (Zeithaml, 1987) as consumer's evaluation about an products overall excellence performance. (Kariuki & Kibera, 1996) postulate that service quality is the agreement of a service to customer specification and expectation, while (Kimonye, 1998) enlightens that service quality is the extent of match between predictable and real service given by the service provider and that the higher the fit, the higher the level of customer satisfaction. On the contrary, (Kang & James, 2004) found that the construct of service quality relies upon the perceived quality, a position backed by (Sultan & Wong, 2010),

who explained service quality as a form of approach showing a long run overall assessment. This study followed the afterward position and examines service quality 'as a form of attitude showing customers long run overall assessment of a service after a service encounter.'

The quality management in institutions, includes: Joseph Juran (1950's), Edward Deming (1950's) and Philip Crosby (1980's) whose works conclude in the spread of the concept of TQM. The discussion on the connection between service quality and satisfaction has been arouse by researchers including; (Spreng & Singh, 1993) who recognized that the more the level of service quality the more the level of customer satisfaction, Stafford et al., (1998) developed that service quality and customer satisfaction are different but associated, while (Shekarchizadeh, Rasli, & Hon-Tat, 2011) argued that customer satisfaction is antecedent to service quality. Satisfaction is usually related with one

particular transaction at a specific time and has been explained by (Spreng & Mackoy, 1996)as an emotional feedback to a product/service experience. Service quality conversely is further similar with a long term attitude. Generally, satisfaction is more analyzable, temporary and transaction-specific, while service quality is supposed to be long lasting.

3.7 Problem Area and Research Focus:

Problem area - It is well known belief that services vary from products in different major respects, it seems improbable that quality definitions were developed for manufacturing practices can be used straight forward to service operations. Opposing to product manufacturing, where it is comparatively simple to assess for example conformance to specifications of an final-product, much of the quality in service operations is in the view of the customer. As a result, statistics on service quality is to be received by capturing customer perceptions. On the other hand, a series of devoted discussions on business support based services held during the second half of 2005 - considering not only practitioners from different large customer organizations, but also financial managers from a broad range of supplier institutions- pointed out that quality in affiliation to services has a unlike meaning to almost each individual - indicating huge difference of perception and definition. More in-depth questioning exposed more usually recognized attributes of service quality such as **'reliable and company reputation'** and **'on-time service delivery'** as well as 'pro-active and skilful service personnel and open communication. Investigating the effect of such traits on total perceived service quality as well as customer and satisfaction supplier performance, though, led to energetic and unanswered discussions. Even though both customers and vendors of business support

services alleged that superior service quality can have a positive effect on organizational performance for both sides, a number of troubles were recognized. First, it is hard to reach on an agreement on the features that make up service quality. Second, it is tough to grade these features in order of significance. Third, it is very tough to recognize and evaluate the impact of service quality on customer satisfaction and finally supplier performance. To conclude, all problems enlisted are further complex due to the association of numerous stakeholders from both vendors and customers of business support services.

3.8 Research Focus

By developing and testing a evaluation instrument to evaluate service quality in a B2B setting, it is planned to merge three genuine paths to attain the degree of Ph.D.:

- Give attention on a ignored aspect of a topic;
- Determining the insufficiency of existing approaches; and
- Evaluating a not previously used construct.

This grouping is expected to yield a contribution to knowledge and to get better our knowledge in the field of service quality management. Deserted aspect of a topic - Within the B2B setting, outsourced business support services continue to enlarge within both the private and public segment. Within the public sector, administrations guidelines on competitive bidding and the use of the FDI have been key factors for privatization. In the case of private sector the important parameters include: reducing risk whilst increasing flexibility, releasing capital for core business processes, and securing scarce skill resources. On the other hand, it is not common to find service quality development as a key driver for outsourcing. However, a continued focus on the monetary benefits of

outsourcing eventually will lead to substandard service quality levels, which in sequence will adversely impact the performance of both customers and vendors of business support services. To conclude, service quality can be taken as an underrepresented feature in outsourcing business support services.

3.9 Previously Used Approaches

To completely capture the service quality construct in relation to business support services, service quality considered as a ignored aspect of business support services and present methods regarded as inadequate, we will develop and test a service quality evaluation instrument for telecom industry. While conventional data collecting and analysis tools such as SERVQUAL and SERVPERF were designed with specific situation to evaluate service quality in a B2B background, instruments used to measure service quality in a B2B environment have still to be grown and experienced.

This thesis emphasizes on the development and subsequent testing of a evaluation tool to assess service quality in B2C setting in telecom sector.

3.10 Deficiency of Existing Approaches

Generally outsourced contracts are developed around Service Level Agreements (SLAs) and Key Performance Indicators (KPIs). As KPIs are to be evaluated and checked throughout the life of a service contract, they are likely to focus on the physical aspects of service condition. Afterwards, it is strange to find KPIs that point of attraction on the more insubstantial features of services and although customer satisfaction levels are often incorporated as a KPI within SLAs, such evaluations does not precisely arrest the affluence of the service quality construct. In brief, there is a call for to focus research

efforts away from the tangible aspect of service provision to fully capture the service quality construct.

3.11 Chapter Conclusion

The discussion starts with relevance of service quality. Deming's 14 point quality principles were dealt in length. In onwards discussions it was emphasized that how quality is useful in service operations and how it differs from products. Further various determinants of service were interpreted. Through Oliver's model, relationship between service quality and customer satisfaction was explained.

Three main and widely accepted models of service quality were also dealt in depth. First one was explained by Grönroos, who explained that the customer's experience of any particular service may be divided into two dimensions: technical quality (i.e. what the consumer receives or the technical outcome of the service delivery process) and functional quality (i.e. how the consumer receives that technical outcome).

Through second model was developed by (Arun Parasuraman, Zeithaml, & Berry, 1988). They identified five gaps that could impact the consumer's evaluation of service quality in four different industries (retail banking, credit card, securities brokerage and product repair and maintenance). These observed gaps were; Gap-1: Consumer expectation - management perception gap; Gap-2: Management perception - service quality specification gap ; Gap-3: Service quality specifications – service delivery gap ; Gap-4: Service delivery – external communications gap ; Gap-5: Expected Service – perceived service gap

Third model studied, which was developed by (Cronin Jr & Taylor, 1992) on SERVPREF which was based upon performance measures of service quality.

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Chapter -IV
Research Methodology

The aim of this chapter is to study the research methods and approaches used to study customer's satisfaction and perceptions of mobile phone users in India. This chapter consists of 19 sections. An overview of the theoretical framework is presented in Section 4.1. Research design is explained in section 4.2. Data analysis techniques are explained in section 4.3. Research objectives are set in Section 4.4 followed by research questions in Section 4.5.Based on research questions and objectives, research hypothesis are formed in section 4.6. Various research paradigms are explained in section 4.7. Section 4.8 describes Justification of the Selected Research Design. In section 4.9 various tools used for data collection are described. Section 4.10 describes about Survey Research Method. In section 4.11 to 4.14 various questionnaire constructs are explained. Section 4.15 describes about sampling technique. Reliability and validity are covered in section 4.16. Data analysis strategy is explained in section 4.17 while 4.18 cover ethical considerations. Lastly section 4.19 describes how data was collected.

The chapter two, reviewed literature about consumer satisfaction in context of five main areas: quality of service, perceived value (Tariff/Billing), customer care services, customer loyalty and customer retention. These five fundamental concepts were discussed in detail, followed by the development of a theoretical framework. Nine hypotheses were then developed based upon research questions and research objectives.

This chapter provides and demonstrates how the data were collected and further analyzed the process to test the nine hypotheses. In addition, this chapter provides clarification of the ethical considerations that relate to the behaviour of the research.

4.1 Research Philosophy

Research philosophy is the basic belief and academic composition upon which research in a field of knowledge is based. (Sobh & Perry, 2006) established that the model proposed by a researcher is antecedent to the choice of research methodology and the types of questions to be asked. (Guba, Lincoln, & others, 1994) identified three basics of a paradigm; ontology, epistemology and methodology. Basically, ontology is "reality", epistemology is the association between the reality and the researcher and methodology is the method used by the researcher to find out that actuality. The main ontological feature under the positivist paradigm is that the researcher and reality are apart. The term epistemology comes from the Greek word "episteme" meaning knowledge.

4.2 Research Design

Methodology is a blend of techniques used to make enquiry into a specific circumstances (Easterby-Smith, Thorpe, & Lowe, 2002).It is related with linking the theoretical aspects of research with the suitable practical data collection techniques or instruments . In the meantime, a choice of research design "reflects decisions about the main concern being agreed to a range of dimensions of the research process" (Bell & Bryman, 2007). Therefore, research design develops overall map for the realistic actions of the research methodology, primary data collection methods and data analysis (Hussey & Hussey, 1997); (Churchill Jr, 1979) dependable with the research philosophy. A few numbers of variables give help to propose to the formulation of the present research plan. The nature

of research study aims, reason, and research area are seen as major aspects resolute the research design.

4.2.1 Research Philosophical Position

A research philosophy discovers the researcher's viewpoint in defining of phenomena, and relies on how researcher thinks about the development of facts. Accordingly, it is a prototype of idea about the way in which the technical steps of the research should be planned and how related data should be collected and evaluated. Therefore it demonstrates the image that controls and influences all other related strategies and techniques. (Saunders, 2011) have classified research steps into different layers and possible approaches which should be occupied in blend with the nature of the research and the questions the researcher is looking for to answer.

4.2.2 Research Approach

Qualitative research is an broad term considering an array of exploratory techniques which search for to decode, explain, interpret and or else come to terms with the meaning, not the frequency, of certain more or less naturally occurring phenomena in the social world (Van Manen, 1990) . The investigative perspective offers service marketing research an suitable approach in which intangible variables could be evaluated (Bharadwaj, Varadarajan, & Fahy, 1993). Whereas such features represent the main dominant factors that affects a company's image and perceived value in the background of services. Additionally , the analytical approach enables the researcher to give attention on understanding what is happening in the state of affairs of a specific feature and helps the interpretation of data (Carson, Gilmore, Perry, & Gronhaug, 2001). Similarly, it

permits a crystal clear accepting of composite situations linking human and organizational behaviour (Remenyi & Williams, 1998).

In such circumstances, measuring the control of marketing orientation and the traditions firms manage customer satisfaction and customer retention in this research will be carried out not only on organizations but also in organizations as an in detail assessment.

Besides to challenges shaped by the nature of the telecom service, operators preferred performance is directed at achieving the greatest levels of customer satisfaction and authenticity. Therefore, research on people encounters many problems, such as recognizing behaviours, finding motivators, attitudes and judging the perceived satisfaction, as well as the limits linked with the principles approval required for research related to people.

4.3 Data Analysis

In accordance with (Taylor-Powell & Renner, 2003) there is no single or best way for data analysis; to follow a specific approach, it depends on three aspects:

(i) The questions: The researcher wants to reply whose questions?

(ii) The requirements of those who will make use of the data/information/outcomes and

(iii) Availability of Data resources.

While both qualitative and quantitative data analysis techniques are used in the present research, the highly quantitative characteristics of this research calls for explanation and quantitative techniques which comprise the bulk of the data analysis and assessment of this research**.**

Classifying and Coding Data

Coding of data refers to the organized way in which data are concise into smaller analyzable units that come out from collected data. As per (A. L. Strauss, 1987) the superiority of qualitative research relies on a large extent on the quality of coding, the procedure which involves the detection and identification of categories. Classifying and coding data enables the firms, recovery and understanding of data. It is achieved through the creation of classes and theories derived from the composed data themselves, inductively preparing data for more in-depth analysis.

(Taylor-Powell & Renner, 2003) suggested a two steps for coding and categorizing data: first, to identify patterns (e.g. ideas, concepts, interactions,), and second, to arrange patterns into logical categories that sum up and bring meaning to the text. This procedure could be completed within different methods as per (A. Strauss, Corbin, & others, 1990) Who has determined three levels of coding; open, axial, and selective.

Open coding is the first stage in data attainment which shows to breaking down the data into separate distinguished units of meaning. It is open 'open' coding (Goulding, 1999) which is completed by examining closely the interview, 'Field-note', or other document very closely; line by line or even word by word (A. L. Strauss, 1987). In line with (A. Strauss & Corbin, 1998) the first step in the coding process is what does the word seems to mean or what could it mean? . Therefore, the researcher can start with some questions that need to be continually answered, which are helpful in open coding;

- In fact, What is this? What does it stand for in reality? (Goulding, 1999).
- What is phenomenon being observed in these data structure?
- What is the fundamental socio-psychological problem being noticed?

- Who is responsible for all of it ?
- Which kind of Relationship is being observed here ?"

Therefore, the result of open coding is a formulated list of significant classes which includes all observing codes.

Axial coding: It is the subsequent step after open coding which throws light on making connections between developed categories.

Selective coding: It tends to "the technique of selecting the central category, scientifically relating it to other categories, validating those associations, and filling in classes that need further modification and development"(A. Strauss et al., 1990).

In comparison to axial coding, selective coding is a advanced level of concept that includes selecting the center category, relating it to other categories explaining and validating those relationships. Consequently, it is considered as an advanced stage of research analysis in which classes are associated to the core category finally accomplishing the basis for the grounded theory.

Various factors are used for selecting core coding(A. Strauss et al., 1990) :

- It must be innermost and appear regularly in the data.
- The clarification that evolves by relating the classes is rational and reliable.
- The name used to explain the central category should be adequately conceptual.
- The theory is able to make clear variation as well as the main point made by the data.

The role of the researcher in formulating the core category is critical as an "author of a theoretical reconstruction" (Mills, Bonner, & Francis, 2006) who develops the template

that provoke analysts' thinking about the associations between emerged categories (A. Strauss et al., 1990). A procedure helps to frame a 'story' which is a main aspect in developing the grounded theory (Moghaddam, 2006). "The story line is the final conceptualization of the main category, and as such, this "conceptual label" must fit the stories it serves (A. Strauss et al., 1990).

To sum-up, selective coding is of significant importance to the research analysis process by which the precise core category is found and positioned at the centre of the assessment being explored (Moghaddam, 2006).

4.3.1 Interpreting, Exploring and Presenting Data

At this stage of the data analysis, the researcher draws consideration towards making outcomes of the data gathered. The major areas of concentration in this stage are revealing patterns and exploring linings within a collection, and also across collections, and making general findings about the fact that is being analyzed (Seidel, 1998).

Therefore, in practice, the researcher investigates the probable connections between the categories and also will build up a descriptive framework of the participants' attitudes regarding research facts.

Quantitative data analysis aims at making sense of the gathered quantitative data to draw important interpretation. The quantitative data analysis method is concerned with choosing suitable analysis techniques w.r.t. the characteristics of collected data; instruments used and intended research objectives.

As a preliminary step, all collected questionnaires were reviewed for wholeness and correctness and partially completed questionnaires were selected for exclusion from

analysis. Also, applicable questionnaires were identified for computer statistical processing purposes.

Determining the suitable kinds of statistical measurements to be used is based on 'what' variables should be calculated, and 'how' to measure these variables? In this study, mean, standard deviation, One-Way ANOVA and Post-Hoc as applications of the Statistical Package for Social Science (SPSS) version 22.0, were conducted in order to determine customer satisfaction level on various aspects.

4.4 Research Questions

By focusing on services associated with telecom service providers which are being delivered to customers, this research will try to deal with the following questions:

1. What is the quality of service being delivered to customers by major telecom operators?

2. Is there any difference in quality of service of various telecom operators?

3. What is the relationship between customer satisfaction and quality of service?

4. To deliver good quality of service is helpful in retention of customers?

The three main reasons for focusing our research on relationship of service quality with customer satisfaction in telecommunication sector are as follows.

- Increasing competition among telecom service providers, reducing tariffs, declining profits, banging entry of Reliance Jio Facilities/Service management has been identified by (Anantharanthan Parasuraman, Zeithaml, & Berry, 1985) as a fruitful area for service quality research.

- Telecommunication sector is one of the fastest growing sector accounting for approximately 7.5% of Gross Domestic Product in the India but now consolidating.

This issue is of anxiety of everyone in today's age of Smartphone, where smart life and Smartphone are two side of a coin**.**

4.5 Research Objectives

The main objective of this thesis was to identify service quality attributes that were important to telecom service provider's practitioners. To achieve main goal, firstly researcher studied the relevant literature available and then used survey method to explore a variety of service quality items seem to be important to judge service quality. Subsequently, researcher developed a survey questionnaire tool to generate service quality perceptions, from customers of four major telecom operators (i.e. BSNL, Airtel, Idea and Vodafone) in West Central Indian region. Three states Rajasthan, Madhya Pradesh and Gujarat were selected randomly to conduct the research. Finally, a variety of suitable statistical tests were applied to analyze the data gathered. Outputs from this research would enable to the understanding of the service quality construct in relation to practicing telecom managers and planners of various telecom operators. The research objectives were broadly set as below:

Objective 1: To Understand the Mobile Telecommunication Market of India

Objective 2: To understand the Service Quality Delivery Models

Objective 3: To understand the Relationship of Customer Satisfaction with:

- **a.** Network Quality
- **b.** Perceived Value
- **c.** Customer Care Services
- **d.** Customer Loyalty

Objective 4: To study, service quality delivery level, being delivered by GSM service providers to customers and their comparisons on four constructs mentioned in objective 3.

Objective 5: To Measure the Overall Satisfaction with the help of constructs mentioned in objective 3.

Objective 6: Proposed Measures to be takes by service operators based on the study.

4.6 Development of Research Hypothesis

The foundation of the research is development of research Hypothesis. The entire research rests upon it, and a good theoretical framework helps in recognizing and classification the fundamental variables in the situations that are connected to the research problem (Sekaran, 2000). The theoretical framework for the current research was started from reviewing of the literature and is closely associated to the five fundamental disciplines of customer satisfaction which are results of quality of service, perceived value (Tariff/Billing) , customer care services and customer loyalty .These fundamental categories offer the common setting of the significant factors which contribute to customer's intention to select and continue with a particular telecom service provider in India.

Table 4.1 provides a summary of the research hypotheses and questions to be investigated in the current research.

1. Is there any relationship between Network Quality of Services and Customers Satisfaction?

2. Is there any relationship between Perceived Value (Value for Money) and

Customers Satisfaction?

3. Is there any relationship between Customer Care Services and Customers Satisfaction?

4. Is there any relationship between Customer Loyalty and Customers Satisfaction?

5. Are all the Cellular Service Providers delivering "Quality of Services" to their customers and are customers satisfied by quality of service?

6. Are customers satisfied by Tariffs (Data and Voice) being offered by Cellular Service Providers?

7. Whether subscribers are satisfied by "Customer Care Services" being offered by Cellular service providers?

8. Are all the customers of various operators are equally loyal?

9. Is there is any difference in overall satisfaction of customers of various telecom service providers?

Table 4.1: Summary of Research Objectives and Hypotheses

Research Objective	Hypothesis
1. Is there any relationship between Network Quality/Quality of Services and customers satisfaction?	**Ho_1** There is no significant relationship between **Network Quality** and **Customer Satisfaction** of Mobile Telecommunication services in India.
2 Is there any relationship between **Perceived Value** (Value for Money) and **Customers Satisfaction**?	**Ho_2** There is no significant relationship between **Perceived Value** (Value for Money) and **Customer Satisfaction** among customers of Mobile Telecommunication service providers in India**.**

3	Is there any relationship between **Customer Care Services** and **Customers Satisfaction**?	**Ho_3** There is no significant association between **Customer Care Services** & **Customer Satisfaction** among customers of Mobile Telecommunication services in India.
4.	Does the **Customer Loyalty** give rise to **Customer Satisfaction** among customers of Mobile Telecommunication service providers in India?	**Ho_4** There is no significant relationship between **Customer Loyalty** & **Customer Satisfaction** among customers of Mobile Telecommunication service providers in India.
5.	Whether all telecom operators are providing homogeneous Services to their customers?	**Ho_5** There is no difference in Network Quality being provided by Mobile Telecommunication service providers in India.
6.	Do customers of all the service providers experience same perceived value (Value for Money)?	**H_{06}** There is no difference in Perceived Value (Value for Money) being experienced by customers of Mobile Telecommunication service providers in India**.**
7.	Whether all telecom operators are offering homogeneous customer care services?	**H_{07}** There is no difference in Customer Care Services being experienced by customers of Mobile Telecommunication service providers in India**.**
8.	Are all the customers of various operators are equally loyal?	**H_{08}** There is no difference in Customer Loyalty among Mobile Telecommunication service providers in India.
9.	Is there is any difference in overall satisfaction among customers of various telecom service providers?	**H_{09}** There is no difference in overall customers Satisfaction being experienced by customers of Telecom Service Providers in India.

From above discussion, following hypotheses were proposed to test various aspects undertaken in this research.

H_{01} There is no significant relationship between Network Quality and Customer Satisfaction among customers of different Mobile Telecommunication service providers in India.

H_{02} There is no significant relationship between Perceived Value (Value for Money) and Customer Satisfaction among customers of different Mobile Telecommunication service providers in India**.**

H_{03} There is no significant relationship between Customer Care Services & Customer Satisfaction among customers of different Mobile Telecommunication service providers in India

H_{04} There is no significant relationship between Customer Loyalty & Customer Satisfaction among customers of different Mobile Telecommunication service providers in India.

H_{05} There is no difference in Network Quality being provided by different Mobile Telecommunication service providers in India.

H_{06} There is no difference in Perceived Value (Value for Money) being experienced by customers of different Mobile Telecommunication service providers in India**.**

H_{07} There is no difference in Customer Care Services being experienced by customers of different Mobile Telecommunication service providers in India**.**

H_{08} There is no difference in Customer Loyalty among different Mobile Telecommunication service providers in India.

H_{09} There is no difference in overall customers Satisfaction being experienced by customers of different Mobile Telecom Service Providers in India.

4.7 Research Paradigms

A paradigm is an overall theoretical framework (Guba et al., 1994) that directs the researcher to suitably conduct the research. Paradigm issues are vital and one should be clear about what paradigm guides his approach. A paradigm can be explained as serving to describe what should be considered for study, what questions ought to be asked and what policy should be taken care in analyzing the answers received (Guba et al., 1994) . According to experts , there are only four types of research paradigm. These are Positivism, Critical theory, Cons**t**ructivist, and Realism (Guba et al., 1994) . A summary of every paradigm as well as the explanation for choosing a positivist paradigm for the current research is described in detail

4.7.1 Positivism

The positivist point of view grasp the idea that there is a globe that can be impartially explained and evaluated (Lincoln & Guba, 1985,) (Guba et al., 1994) . The positivist paradigm is related with the outside world and is pillared upon the view that rather than being incidental subjectively through feeling, distinctiveness of the exterior world can be evaluated through various objective methods (Easterby-Smith et al., 2002) . Data collection process for this paradigm is generally organized in a planned structured way without the researcher's association. This paradigm is frequently used to evaluate and analyze linking relationships between variables that are reliable across time and across the context of the research facts (Perry, Riege, & Brown, 1999). It is related with the

evidence of a theory (Deshpande, 1983) , and does not concentrate much on the finding and advancement of new theories (Lincoln & Guba, 1985) ,

Data collection process for this paradigm is generally organized in a planned structured way without the researcher's association. This paradigm is frequently used to evaluate and analyze linking relationships between variables that are reliable across time and across the context of the research facts (Guba et al., 1994 p.111). A positivist paradigm also considers empiricist, experimental, scientific, quantitative or deductive approaches (Gregory William Ticehurst & Veal, 2000) . Accordingly when the researcher follows appropriate procedures, research outcomes will not be affected by researcher bias and value (Guba et al., 1994).

4.7.2 Critical Theory

Such type of paradigm insists that reality is detained and is based on the past situated structures that can be transformed over the time. It frequently requires long-term ethnographic and historical studies of institutional techniques and structures. The critical theory throws light on the examination and conversion of cultural, social, economic, political, ethnic, and gender values.

In this paradigm, the researcher keep engaged in the research and will share facts and social action with respondents (Guba et al., 1994).

It also stresses actuality based on the perceptions held by a cluster of individuals. In brief, the epistemology of critical theory involves an interactive relationship between the researcher and the object being studied.

4.7.3 Constructivism

A constructivist paradigm possesses that reality is subjective and is build upon individual perceptions of truth while the world has numerous realities (Easterby-Smith et al., 2002) (Perry et al., 1999) .

In this paradigm, perception is the mainly vital reality concern, while knowledge is build-up as per an individual's perceptions and attitude about the world, that is, the researcher and the respondents should be interactively associated to literally create the findings. To examine the individual's perceptions and beliefs, a researcher has to be a 'sensual participant. Therefore, constructivists depend on a communication between interviewer and respondents.

4.7.4 Realism

From a pragmatist opinion, there is a true world to discover (Perry et al., 1999) even though it is incorrectly and probabilistically detained (Guba et al., 1994). A realist paradigm shows that perception is not a actuality, but a gap to reality through which a image of actuality can be reflected when combined with other perceptions. This paradigm stress upon the distinction between truth and perceptions about reality; that is, perceptions are not taken as truth (Perry et al., 1999) . To explain clearly, the data should be gathered from a number of sources (Perry et al., 1999) . The epistemology of this paradigm insists that the results are likely true (Perry et al., 1999). To expose these findings, objectivity needs to be maintained but dualism is deserted (Guba et al., 1994). Finally, in the realist paradigm, the researcher impartially tries to understand and describe why people have different experiences rather than search for external reasons and basic laws to explain their behaviours.

4.8 Justification of the Selected Research Design

The basic stage in the research design concentrates on opting what research paradigm is most appropriate for the current research. After reviewing literature and discussing with experts out of four major research paradigms (positivism, constructivism, critical theory, and realism) the positivist paradigm was found most appropriate for the current research because the purpose of the aim is to discover cause-effect relationships as well as value-free theory testing (Perry et al., 1999) . The deductive method of testing theories is linked with the positivist paradigm and it is general for methods such as survey research to be used to gather data for study (Perry et al., 1999).

As well the present research does not plan to construct theory, and so realism, critical theory, and the constructivist approach were not found appropriate.

Usually, to carry out quantitative research, it will build up a model based on information from a review of previous literature and test the model by gathering data from many respondents(W. G. Zikmund, 2003) . The most familiar theoretical framework for quantitative research is to search for the causal relationships among variables, instead of just explain the variable, where one is the cause and the other one is the effect (Sekaran & Bougie, 2003). The independent variable is the cause that affects the dependent variable, or the effect, in either a positive or negative way (Sekaran & Bougie, 2003). As per (Veal, 2005), a quantitative method looks to quantify the data collected, applies a few forms of statistical analysis and analyses data in the form of statistical output based on comparatively small sample sizes and provides insight and understanding of the problem.

This research constitutes a quantitative study which has established formed a model framework relied upon earlier studies. The purpose of this research is to examine nine

hypotheses associated to the factors that influence customers' satisfaction, loyalty to select and stay with particular mobile service providers in India. Additionally, this research tries for quantifying the associations between variables and will use data to demonstrate these relationships. The researcher collected data in terms of numbers of responses using a questionnaire survey, and the methodologies targeted at verification of theoretical hypotheses. Therefore, it is obvious that a quantitative approach is most appropriate because this research seeks to answer set research hypotheses rather than trying to build theory.

The next section provides an overview of three types of data collection commonly used in business research.

4.9 Tools Used for Collection of Data

There are a variety of ways through which data can be collected and that too from various sources (Sekaran & Bougie, 2003).

These methods can be categorized in three core categories: experimental, observation, and survey. Here survey method was used.

Survey is one of the main familiar tools used to gather primary data from a representative sample of individuals (Denzin, 1978). The term survey refers to the complete process of conducting the data collection and involves the collecting data from individuals using a questionnaire or interview schedule (Denzin, 1978). Questionnaire surveys are helpful when data are required from samples representative of a pre-defined mass population and it is helpful when the research questions point to the need for comparatively structured data (Houtkoop-Steenstra, 2000) .

In conformity with the nature of the positivist paradigm, this research targets to test research hypotheses using a quantitative approach. In this study the survey questionnaire method was chosen and a set of questions was put to fill to randomly selected respondents of four major telecom companies. The details about the particular survey research methods used to gather data in this research will be discussed in the subsequent section in length.

4.10 Survey Research Method

The very purpose of this part of chapter is to demonstrate survey research methods and to propose the data collection method used in the current research. As said by Ticehurst and (Houtkoop-Steenstra, 2000) , questionnaire surveys can usually be carried out in one of the following two ways:

- Interviewer completed questionnaires and/or
- Respondent-completed questionnaires

In case of interviewer–completed surveys, an interviewer reads the question out to the respondents and note downs the respondent's answers on the questionnaire format. In case of respondent-completed surveys, respondents alone interpret and fill out the questions themselves by their own. There are many types of questionnaire survey that are normally used to gather data which includes face-to-face interviews, telephone interviews, mail surveys and surveys conducted via other communication media (Houtkoop-Steenstra, 2000). For the current research, the Respondent completed method was chosen because this method was found to generate more accurate information and provides more complete responses (Houtkoop-Steenstra, 2000) .

4.10.1 Questionnaire Design

Subsequent are some of the essentials methods for Measuring Customer Satisfaction Factors on which questionnaire was built upon.

In the last two decades the measurement of customer satisfaction has attracted substantial attention from both practitioners and academicians (Arun Parasuraman, Berry, & Zeithaml, 1991) (Cronin Jr & Taylor, 1992). Over 15,000 articles have been published on customer satisfaction measurement in the last 20 years. The key interest in customer satisfaction measurement is built upon service quality features/attributes and to help practitioners to understand the association between these two fundamentals. There are a numerous methods for measuring customer satisfaction attributes. These comprise the critical incident techniques, Kano's questionnaire, importance grid, regression analysis with dummy variables, and the study of complaints and compliments.

4.10.2 Kano's Questionnaire

To classify service (Kano, Tsuji, Seraku, & Takerhashi, 1984) developed a questionnaire attributes. For every attribute, a pair of questions was prepared in which the respondent was asked to answer two questions:

- If the service attribute performed poorly?
- And if the attributed performed perfectly?

Above analysis was concluded using the five point-Likert scale (extremely satisfied, somewhat satisfied, neither satisfied nor dissatisfied, somewhat dissatisfied, and extremely dissatisfied). Next, the rate of responds for each attribute was considered for attribute classification.

The constraint of this method was that the questionnaire becomes too long when many attributes are analyzed. There was a chance that the boundaries between different classes are indistinct. In broad, the application was costly, time consuming and relatively not suitable in practice.

Cross sectional design was applied to check the relationship between corporate image, service quality, and customer satisfaction. The suitability of this design also anchored on its adaptability, admissibility of questionnaires and its influence in collection of data from a huge number of respondents in a relatively small period. Considering the aforesaid research problem and the selected research philosophy, a descriptive survey method was found the most appropriate for achieving the research objectives under this study.

The development of a survey is significantly decided by the nature of the research questions and the research objectives(Oppenheim, 2000). The initial stage of the data collection usually starts with the process of questionnaire design. as it is very significant for researchers to plan the instrument itself in line to gather the data. In developing the questionnaire, each question has to relate back to the research questions and hypotheses(Oppenheim, 2000). In current research, each question in the questionnaire was relied on the literature review in Chapter two and the review of existing research regarding quality of service, customer satisfaction, and customer loyalty. Afterwards, a series of measures were considered, developed, and included into the design of the survey. As said by(Oppenheim, 2000) ,

to correctly design a questionnaire, researchers should concentrate on following three major areas:

(1) Phrasing/Wordings of the questions should be simple enough

(2) The questions should be cautiously worded to make simple for tabulating, coding, and interpreting;

(3) Questionnaire layout and the series should be planned to stay respondents interested.

The following debate enables more details regarding these three issues and also covers other significant actions involved in the questionnaire design for this study.

Initially, wording and language used in the questionnaire, all questions in the survey were simple and clear worded in a way that could be understood by the respondents (i.e.no ambiguity) (Oppenheim, 2000). Questions were not too long because respondents can get exhausted in answering long questions (Oppenheim, 2000). The words used in the questionnaire were of English originally. The questionnaire was then translated into "Hindi" because the respondents were West Central India based people who were able to understand Hindi very easily. The very purpose of translation was to make sure that the respondents could easily understand all of the questions shown in the questionnaire. To make sure the translation of the questionnaire survey in this research was accurate and interpretable; all dissimilarities in the translation were addressed and corrected by the researcher. Secondly, the types of phrases, questions, and measurement scales used in the questionnaire were selected very cautiously because it was critical to decide how the researcher wants each question to be replied. Questionnaire design may use a grouping of open-ended questions and pre-coded or closed questions (Sudman & Bradburn, 1982). An open-ended question permits respondents to recommend other pertinent opinions and recommendations and also needs a written response. The responses to open-ended questions can be hard for computer system to analyze and

response rates can be low enough as people are often too lazy to write down complete full-length answers (Sudman & Bradburn, 1982).

In contrast, a closed question can be replied speedily by respondents by choosing from multiple choice answers that have been provided by researchers. , This research as a rule used closed questions to ensure that the options are mutually exclusive and to code the information for subsequent analysis

To conclude, the question series and the layout of the questionnaire were designed to keep respondents involved. For the current research, in order to help the respondents to answer the questions without complexity, all questions were reasonably and properly organized in suitable sections. Directives on how to complete the items in each section were also given (Sekaran & Bougie, 2003).

Prior to respondents were required to answer the questions designed within the survey, they were educated about the research objectives. After participating in the survey questionnaire, the respondents could ask questions about the survey. It was also informed that participation in this survey was not compulsory with an assurance about secrecy and privacy of the information given by respondents. Further, the letter made it clear that all questions asked in the questionnaire would be used only for the research objectives.

4.10.3 Construction of Survey Measures

The foundation of this research is measurement of customer satisfaction. The phrase **"customer satisfaction"** refers to the consumer's feeling toward a product/service, which are results from the summing up of their evaluation of each aspect of an offering (Zeithaml, Berry, & Parasuraman, 1988)(Zeithaml, Berry, & Parasuraman, 1996). Customer satisfaction is the collective occurrence of customers' purchase and

consumption experience affected by two factors: expectation and perceived service performance (Gotlieb, Grewal, & Brown, 1994) (Ranaweera & Prabhu, 2003),

gave five items to evaluate customer satisfaction in the framework of the telecommunications industry. These three items obtained a high degree of assurance in terms of their reliability (Cronbach's alpha). Thus, these five items i.e. **Network Quality**, **Customer care Services**, **Tariff, Customer Loyalty and Perceived Value** were adapted and used in this research to measure customer satisfaction in telecom service market.

As discussed before, this research used a blend of items from the literature review in Chapter 2, the review of existing research regarding consumer decision making, customer satisfaction, and customer loyalty as well as the existing research in the environment of telecommunication service. All questions in this research intended to measure respondents' perceptions regarding the fundamental factors that influence their satisfaction to their present mobile provider. The question series in the questionnaire was randomized and begun with easy-to-answer questions, and slowly shifted to increasingly more difficult questions (Hinkin, 1998).

An argument of how each set of measures was built upon in the survey is now given. A copy of the English version of the survey is provided in **Appendix -I** and a copy of the Hindi version is provided in **Appendix-II.**

In present research, the survey questionnaire was divided into six sections. Each respondent needed approximately 8-10 minutes to complete the questionnaire in the face-to-face interview. The question sequence started with easy-to-answer questions to increase respondents' cooperation (Hinkin, 1998). In **Annexure-A**, respondents were asked some basic questions about their demographic information, monthly present

service providers , expenditure on telecom services, , reason of changing operator, delivery of information regarding various offers etc. They were asked to select the suitable answer for each question. The purpose of this section was to know some general information about customers who used mobile services, and which company was their current service provider. The questions in this section are presented in following

Table 4.2:

Table 4.2 Format of Questionnaire

Questionnaire to Judge Customer Satisfaction based upon Network Quality/ Services of Mobile Network					
SN	**Annexure-A**				
1	**Gender**	**Male**		**Female**	
2	**Mobile No. (Optional)**				
3	**Service Provider**	BSNL	Airtel	Idea	Vodafone
4	**State**	Rajasthan	Madhya Pradesh	Gujarat	
5	**Age**	16-25	26-40	41-55	>55
6	**Is this your first service provider?**	Yes		No	
7	**How many operators did you change till date ?**	1	2	3	>3
8	**Reason to change first Mobile operator**	Billing Problem	Poor Network Quality	Call Drop Problem	Poor Customer Care Services
9	**Reason to change Second Mobile operator**	Billing Problem	Poor Network Quality	Call Drop Problem	Poor Customer Care Services
10	**What do you check first while choosing mobile operator**	Good Network Quality	Low Call Rates	On recommendations of Near and dears	Low Internet Data Tariff
11	**For what purpose you use the mobile most**	For Voice calls	Internet Uses		
12	**Your monthly expenditure is (Rs.)**	50-100	100-200	200-500	> 500
13	**Did you timely get information about various schemes/tariff changes/ promotional offers**	Yes		No	

In Annexure –B, of the questionnaire, Sections 2, 3, 4 and 5 were based on a five-point Likert-type scale to ask the respondents relevant questions. In this scale, "1" represented 'strongly disagree' (the most unfavourable response to the statement) and "5" represented 'strongly agree' (the most favourable response to the statement) (Hinkin, 1998) .

In **Annexure –B/1** of the questionnaire, questions were asked to the respondents about the **"Network Quality"** experiences with their existing mobile service provider, In **Annexure –B/2** questions were related to **"Perceived Value"** (i.e. "Billing, Tariff, Recharge") etc. In **Annexure –B/3** questions were related to **"Customer Care Services",** in **Annexure –B/4**, questions were related to **"Loyalty"** (future intentions towards that service provider) and in **Annexure –B/5**, **"Overall Satisfaction"** related questions were asked.

There are many advantages to using a Likert scale. It enables the researcher to evaluate the gap between two points on the scale (Strongly agree and strongly disagree), while being balanced by a neutral (mid) point (Hinkin, 1998) . Besides, it helps the researcher to compute the means and the standard deviations of the responses on the variables. Particularly, a Likert scale can measure the degree of the differences in the preferences among all respondents (Hinkin, 1998) .

The questionnaire thus prepared was based on above specified five attributes. In further discussion all these attributes are discussed briefly and questionnaire was built upon.

4.11 Questionnaire Construct -1: Network Quality

Network quality is one of the most significant drivers of overall service quality in the context of the telecom industry (Wang, Lo, & Yang, 2004) (Kim & Kwon, 2003). (Wang, Po Lo, Chi, & Yang, 2004) and (Ranaweera & Prabhu, (2003) prepared items to measure network quality in the background of the telecom industry which strongly related with the present research. Additionally, these six items demonstrated a good degree of confidence in terms of their reliability (coefficient alpha). Therefore, these six

items were adapted and used in this present research to measure network quality in as shown in **Table 4.3.**

Table 4.3: Measures of Network Quality

Author	Question
(Wang, Po Lo, et al., 2004) and (Ranaweera & Prabhu, 2003)	1. Are you satisfied with Quality of Call clarity when calling and receiving?
	2. Are you satisfied with Quality to keep Call Drops minimum?
	3. Are you satisfied with Quality of Network Coverage ? (Signal Availability outdoor as well as indoor)
	4. Are you satisfied with Quality of Speed of Internet?
	5. Are you satisfied with Quality of voice in roaming?
	6. Are you satisfied with speed of internet access in roaming?

The respondent's responses were recorded on **"Five"** point "**Likert Scale"** as shown in below **Table 4.4**

Table 4.4 Likert Scale Rating

Likert Scale Rating	**1**	**2**	**3**	**4**	**5**
Response	Very Dissatisfied	Dissatisfied	Neither Satisfied nor Dissatisfied	Satisfied	Very Satisfied

The same scale measures were adopted through the questionnaire except question No. 25 and 26, for which separate wordings were used.

4.12 Questionnaire Construct -2: Perceived Value (Value for Money)

Customer perceived value can be described as the ratio between perceived benefit and perceived sacrifice (Ravald & Grönroos, 1996). Perceived value is affected by the consumer's perceptions of marketing mix, service quality, reputation and image of the company and the brand name (Wallin Andreassen, 1994) (Wang, Lo, et al., 2004) gave three items to measure customer value in the framework of the telecom market. It obtained a high degree of confidence in terms of reliability (coefficient alpha). Hence, it was adapted and used in this current research to measure customer-perceived value in the high-speed driven internet service market as shown below:

Table 4.5: Measures of Perceived Value

Author	Question
(Ravald & Grönroos, 1996). (Wallin Andreassen, 1994) (Wang, Lo, et al., 2004)	7. Are you satisfied with Top-up amount on Recharges ? (Full or Extra Talk Time):
	8. Are you satisfied with Variety of Plan Vouchers?
	9. Are you satisfied with Variety of Special Tariff Vouchers?
	10. Are you satisfied with Validity of Plan Vouchers?
	11. Are you satisfied with Validity of Special Tariff Vouchers?
	12. Are you satisfied with Unauthorized Activation of VAS? (Value added Services)
	13. Are you satisfied with accuracy of Charges? (i.e. amount deducted with every call/SMS/Data use)
	14. Are you satisfied with economy of Voice Plan?
	15. Are you satisfied with economy of Voice Data Plan?
	16. Are you satisfied with Variety of CUG Plans?
	17. How will you over all rate Value for Money?

4.13 Questionnaire Construct -3: Customer Care Services

Prior to developing questionnaire following points associated to customer care were undertaken:

- It costs a firm six times to attract new customers than it does to keep an old one
- A dissatisfied customer will inform about 8-9 people on the subject of his problem with the organization.
- Seven out of ten dissatisfied customers will do dealing with you again if you satisfy the complaint in his favor
- If the grievance is resolute on spot, 95% will do businesses with you again

Almost, 68% do so because of an attitude of unresponsiveness by the company or the specific individual. (Source: American Business in Uganda October 1998, 1st edition)Benefits of Customer Care Growth and profits are enthused mainly by customer satisfaction which has a large attitude on customer loyalty. Customer loyalty is a straight result of customer satisfaction that is mostly prejudiced by the value of customer care provided along or with product or service to the customer. A satisfied customer is one whose prospects have been met and with such a customer organizations tend to have advantage in the following ways:

Positive Word of Mouth: Customers are more probable to advise a high service to their relatives, friends, and colleagues. The business will thus prosper on probable and positive image. Creates a Competitive Edge: Outstanding customer care offer a much greater competitive edge than competitors largely because positive service differentiation entails improving all the people aspect of business like motivation and training which are all difficult to duplicate and achieve.

Job Satisfaction: An enjoyable and favourable atmosphere emanating from good customer care will not only result into better moral commitments but also better customer satisfaction hence less complaints. Good customer care would lessen labour turn over, cardiac symptoms and absenteeism.

Based upon the literature review and precious studies, following seven questions were formed as shown in **Table 4.6:**

Table 4.6 Measures of Customer Care Services

Author	Questions
(Kuo, Wu, & Deng, 2009) (Lai, Griffin, & Babin, 2009)	18. Are you satisfied with Customer support and complaint management systems?
	19. Are you satisfied with Promptness (ability to get attendant quickly) at call center through toll free numbers?
	20. Are you satisfied with problem solving Attitude (response of the attendant) at call centre?
	21. Are you satisfied with Attitude (response of the attendant) at Physical customer care?
	22. Are you satisfied with time taken by CCE to resolve your problem?
	23. Are you satisfied with Competence? (ability to provide a solution)
	24. Are you satisfied Customer care services which feed you various offers and change in tariff time to time?

4.14 Questionnaire Construct -4: Customer Loyalty

Customer loyalty can be defined as the customers' intention to keep on doing business with their current service provider (Dick & Basu, 1994). It also describes to their behaviour when they grasp a positive attitude toward a their current service provider (Oliver, 1999). Again Five point Likert scale was used to evaluate the answers of respondents regarding customer loyalty in three states among four telecommunication service providers. This scales obtained a high degree of self-assurance in terms of the reliability as well as validity. As a result, these five items were adapted to be used in this questionnaire as shown in **Table 4.7**

Table 4.7: Measures of Customer Loyalty

Authors	Question
(Nguyen & Leblanc, 2001) (Dick & Basu, 1994)	25. The probability that I would use this service provider again
	26. The likelihood that I would recommend this provider's services to a friend

The responses were recorded on following Likert scale **Table 4.8**

Table 4.8 Likert Scale Rating

Likert Scale Rating	1	2	3	4	5
Response	Never	No	Can't Say	Yes	Definitely

The last section of the questionnaire is Section 6. In this section, respondents were asked to rate Overall Evaluation of services being offered to them. The questions related to this section is presented in **Table 4.9**

Table 4.9: Measures of Overall Satisfaction

Author	Question
From Review of Literature	27. Overall, the value of this provider's services to me is high

4.15 Sampling

Sampling can be explained as the procedure of selecting a adequate proportion of people from the entire population (Sekaran, 2000). The research reveals from the sample can reproduce the overall population (Sekaran, 2000). (W. Zikmund, 2000) Sampling is economic very and helpful when the total population is very large for researchers to study all members. Usually, it is impracticable to collect all data or interview every person in the population due to limitations such as costs, time etc. Analyzing results from a sample instead of analyzing the whole population sometimes produces more reliable results as it avoids the tiredness involved in discussing issues of an entire population and there would be enormous errors in the resulting data collection particularly when the population under study is very large (Sekaran, 2000).

In marketing research, both quantitative and qualitative techniques may decide their samples purposively. In this case researcher tried to adopt simple **"random sampling "** technique in presenting the data. Random samples were taken to gather data

from different categories of people who were using different operator's cellular services in WCR region.

4.15.1 Target Population

The target population is the entire group of people appropriate to the research plan that the researcher wishes to examine (Sekaran, 2000). It is very important for researchers to describe the target population in order to select the proper source from which the data are to be extracted (W. Zikmund, 2000).

The target population for this study was described as respondents who have mobile connection in **"West Central Indian"** region. For study, three states Rajasthan (Developing State), Madhya Pradesh (Developing State) and Gujarat (Developed State) were chosen randomly. The target population for the study was customers who are individual users.

4.15.2 Sample Size

Sample size can be explained as 'the number of observations that are fixed by the expected variance of the population, the extent of acceptable error, and the confidence level' (Krejcie & Morgan, 1970). If the sample size is very small, the results of the study may not actually stand for the population (Gay, Mills, & Airasian, 2011) (Barlett, Kotrlik, & Higgins, 2001).Hence, the sample size should be sufficient enough to answer the research question. Generally, the ratio of observations to independent variables should not at all drop below five to one. The preferred level is between 15 and 20 observations for each independent variable (Hair, Anderson, Tatham, & William, 1998).

(Sandelowski, 1995) advocates that the researcher by no means needs more than a few hundred responses – even for a population of one million. (Wright & Crimp, 1995) explained that sample size larger than 30 and below 500 is suitable for the all research methods. (Israel, 1992) discussed that many researchers and statisticians have previously explained the statistical and cost implications of different sample sizes and have recognized the suitable sizes for various types of studies. The authors accomplished that the least sample size required for conducting market studies as 400 for precision (e) of 5%. As cited by (Field, 2009), classify 300 as a good sample size, 100 as a poor and 1000 as excellent. ***Therefore it confirms that the selected sample size of 1080 is adequate and excellent for the present study***. Hence, in conducting the data collection process for this research, 1080 questionnaire surveys were administered.

Sampling Technique

For factual representation of population, it was determined to extract samples from urban, semi urban and rural population using random sampling in which multistage sampling technique was adopted. Three states: Rajasthan, Madhya Pradesh and Gujarat were selected from West Central India randomly. Further one district was selected from each state for data collection. These districts were Kota (Rajasthan), Mandsaur (Madhya Pradesh) and Dahod (Gujarat). To collect urban samples, the municipal corporations of Kota, Mandsaur and Dahod were chosen due their high nature of urban characteristics.

For Semi-urban samples, again three "Tahsils" from each district were selected randomly. Similarly for Rural samples, nine villages were selected randomly from each district. The detail of samples collected is presented in **Table- 4.10:**

Table 4.10: Distribution of Samples Collected

District	Urban Sample		Semi Urban Sample		Rural Sample	
	City	No of Samples	Town	No of Samples	Area	No of Samples
Mandsaur	Mandsaur City	120	Bhanpura	40	Rural Area	40
			Garoth	40		40
			Sham Garh	40		40
Dahod	Dahod City	120	Dahod	40	Rural Area	40
			Jhalod	40		40
			Devgarh Baria	40		40
Kota	Kota City	120	Ramganjmandi	40	Rural Area	40
			Kaithoon	40		40
			Sultanpur	40		40
Total Urban Samples		360	Total Semi-Urban Samples	360	Total Rural Samples	360
Total Samples 1080						

4.15.3 Pilot Study

The phrase pilot study determines a small-scale version of a full-scale study and particular pretesting of a specific research instrument including a questionnaire/interview schedule (W. Zikmund, 2000). The very purposes of the pilot study is to evaluate the questionnaire wording, sequencing and outline, as well as testing and evaluating data collection and data analysis techniques. It may also be helpful in achieving familiarity and awareness among respondents, guessing response rates, and estimating interview or questionnaire completion times (Veal, 2005). Additionally, the pilot study enables an prospect for researchers to recheck the correctness of data collection in order to reduce errors and weak points from awkward survey design as well as to find out and minimize puzzling interviewing instructions (W. Zikmund, 2000). If the investigation of the data

collection from the pilot survey does not correctly reply the research questions, the questionnaire should be redesigned (W. Zikmund, 2000). In present study, the questionnaire was tested by giving it to 88 pilot respondents who were representative of the respondents in the main study. This group of respondents had mobile connections with internet. Based on the pilot study, it appeared that the survey took approximately 9-12 minutes approximately for each respondent to complete. No survey items appeared difficult to respondents. In addition, the wording of all questions in questionnaire survey was easily understandable. Therefore, no major changes were needed to the survey. The pilot study was conducted in Kota city. The detail of respondents under pilot survey is given in **Table 4.11:**

Table 4.11 Sample Detail of Respondents under Pilot Survey

S.N.	Name of Operator	Number of Respondents
1	BSNL	22
2	Airtel	22
3	Idea	22
4	Vodafone	22
	Total	**88**

4.16 Reliability and Validity in Qualitative Research

In order to find considerable interpretations of data, the reliability and validity of the measuring instruments wants to be ensured (Gay et al., 2011). The purpose of reliability and validity is to minimize errors and evaluate measures (W. G. Zikmund, 2003). Additionally, reliability and validity are concerned with how actual measures are developed for each construct (Carmines & Zeller, 1979).

For a quantitative research, reliability and validity are vital criteria in judging the quality of research. While reliability indicates the **"agreement between two efforts to measure the same thing with the same methods,"** validity is **"an agreement between two efforts to measure the same thing with different methods"** (Campbell & Fiske, 1959) , cited in (Hammersley, 1987). Or we can say, reliability enables the extent to which results are consistent over the time and validity refers to construct validity (Carmines & Zeller, 1979) which determines the degree to which a measurement appears to measure what it is supposed to (Kirk & Miller, 1986)

Some researchers (Golafshani, 2003) discussed that both reliability and validity are more relevant to quantitative than to qualitative research. While Others, explained the adoption of reliability and validity in qualitative studies through developing alternative standards for assessing the quality of qualitative research e.g.(Lovelock, Patterson, & Walker, 1998) (Wolcott, 1994) (Patton, 1990) (Lincoln & Guba, 1985) .

4.16.1 Reliability

Reliability can be described as the consistency of the measure of a variable – i.e. the degree to which measures are free from error and therefore provide consistent results (W. Zikmund, 2000). This research used Cronbach's coefficient alpha to measure reliability. The **"alpha"** is a normally used method to examine reliability for multipoint-scaled items, and it can be taken a perfectly sufficient index to test the consistency (Golafshani, 2003). The coefficient alpha ranges from 0.0 to 1.0. A completely reliable test will have a reliability coefficient of 1.00 (Cronbach, 1951) (Gay et al., 2011). Where the coefficient alpha is better than 0.7, this can be taken an satisfactory/suitable level of

reliability (Hair et al., 1998). The closer the coefficient alpha is to 1.0 , the better the internal consistency reliability (W. Zikmund, 2000).

The data collected was subjected to a reliability test. (Carmines & Zeller, 1979) interprets a Cronbach's α greater than or equal to 0.7 as implying the instrument delivers comparatively excellent measurement tool hence reliable. The 27 items in the study instrument and the resulting data collected from the 1080 cases (respondents) were subjected to Cronbach's alpha test. The resulting reliability statistics reflected α value = 0.878, which meant the instrument on service quality, perceived value, customer care, customer loyalty and overall customer satisfaction used in this study was very reliable. As a measure of criterion related validity or instrumental validity, the reliability of this tool was evaluated to related studies. Sultan and Wong (2010) deployed an instrument with alpha (α) = 0.8462 and considered it reliable. (Santos, 1999) interpreted an overall (α) = 0.8339 as reliable in determining the relationship between service quality and customer preferences.

Table 4.12: Reliability Analysis using the Cronbach's alpha (α) Coefficient / Marketing Orientation Measurement Tool

Sub Domains	No. of Items	Alpha Value
Network Quality	6	0.75
Perceived Value (Tariff /Recharge)	11	0.73
Customer Care	7	0.79
Loyalty	2	0.76
Overall Judgment about Service Provider	1	n/a
Total (Over All)	27	**0.878**

4.16.2 Validity

Validity can be explained as the accuracy of measurement used to measure what is supposed to be measured (Golafshani, 2003) (W. Zikmund, 2000). There are various types of validity tests as explained below:

1) **Content validity**: Content validity is a measure of whether a scale rationally appears to accurately reflect what it is intended to measure (W. G. Zikmund, 2003). Or, content validity shows the measure that includes an adequate and representative set of items (Sekaran & Bougie, 2003) .
2) **Criterion validity**: Criterion is an existing measure that is taken as an adequate and valid indicator for the objective construct. This validity is the able of a measure to correlate with other measures of the same construct (W. G. Zikmund, 2003). This shows correlating the criterion with the new measure that the researchers try to evaluate. If a new measure correlates with a criterion measure at the same time, then

it is a concurrent validity (W. G. Zikmund, 2003) . On the contrary, if a new measure correlates with a criterion measure in the future, then it is a predictive validity (W. G. Zikmund, 2003).

3) **Construct validity:** Construct validity is a measure to verify a system of related hypotheses appeared from a theory based on concepts which are recognized during the statistical analysis of the data. Its intention is to measure how well the measure reflects the target construct. An evaluation of content validity was undertaken in this research to guarantee that the questionnaire measured a sufficient and representative set of items that answer the research questions (Sekaran, 2000). 1) To set up the content validity for this research, the measurements from earlier studies in the background of service industries including the telecom market were thoroughly reviewed and modified to be included in the scale used in this study. The scale was then tested on a set of respondents similar to the sample of this study. As per opinions and response from previous studies and the pre-test respondents, the measurements were lastly customized. Therefore, a good degree of assurance of the content validity was achieved. Additionally, in order to increase the levels of questionnaire accuracy, two industry experts assisted the researcher by checking the questionnaire survey to see if it included all relevant questions.

4.17 Data Analysis Strategy

When all data have been gathered, the next step was the process of data analysis in order to attend to the research questions (Sekaran, 2000). The raw data from the collection procedure had to be converted into information in a format that was appropriate for decision-making (Sekaran, 2000). In this part, data processing techniques and analytical techniques used in this research are elaborated in more depth.

4.17.1 Data Processing Procedure

The process of converting raw data into useful information consists of numerous processes including coding ,editing, data entry, and data analysis (Tayur, Ganeshan, & Magazine, 2012). Editing is the first step in the data processing technique. This is the process of examining and adjusting the data to make the it ready for coding and move to data storage. The aim of editing was to make sure that all data have wholeness, consistency and reliability (Tayur et al., 2012). In research , there are two types of editing: field editing and in-house editing (Tayur et al., 2012).

Field editing is generally used with data from interviews. Its very purpose is to recheck, on the same day as the interview, for various aspects as legibility of handwriting. In contrast, in-house editing is mainly used with questionnaire surveys. Therefore, in the present research, in-house editing was conducted to check for errors and omissions in the questionnaires before coding in order to make certain that all data collected were attuned to be complete, readable and consistent.

Subsequent to all data were edited, coding is the second step of the data processing process. It is a critical procedure because computer analysis was conducted by using the coded information from the questionnaires. Coding is the method that identifies and

categorizes the answers from questionnaires by using arithmetical scores, before these scores are fed to the computer. In this case, closed questions were mostly used for the data collection, when respondents were asked to select only one suitable reply for each question, and a numerical score (As per Likert scale) was associated to each reply.

The third step was data entry. Data entry is the procedure of feeding data from a survey questionnaire to a computer. Using Manual keyboard data was fed into a computer in this research .The Statistical Package for the Social Sciences (SPSS) version 22.0 was further used for the vary purpose. To make sure correctness in entering data, error checking was applied to recheck if all codes were verified and corrected as essential. Data analysis was the last step for the data processing procedures. Analysis is the application of reasoning to know and understand the data that have been collected (Tayur et al., 2012).

There are three major objectives of the data analysis:

1. To ensure the preliminary ideas concerning frequencies, central tendency and dispersion;
2. To examine the goodness of data in terms of reliability and validity; and
3. To examine that whether the hypotheses are substantiated.

In this study, the SPSS was chosen to investigate the data in terms of descriptive statistics. The descriptive statistics analysis intended to explain information from the data collected as well as the calculation of frequency distributions, averages and percentage distributions.

4.17.2 Analytical Techniques

After the data were gathered, coded, edited, and entered into the computer, the process of data examination was undertaken. To analyze the data, methodology applied is explained in below discussion:

4.18 Ethical Considerations

Ethical considerations are of vital importance to the research. Research ethics refers to set of rules of morally good conduct for researchers. The main purpose of ethical considerations in this research is to safeguard interviewees from harm and undesirable consequences that might occur during and after the data collection procedure(Veal, 2005). The researchers should not pretend the nature of the study to respondents and should not compel respondents to participate in any survey (Sekaran, 2000).

In this study, before collecting the respondent's response, it was educated to every respondent about all the search aspects such as the research objectives, purpose, and procedures, as well as their right to stop the interview at any time. Also, privacy and secrecy were explained to make sure that all respondents were secluded from harm and undesirable consequences that might have occurred after the data collection process. Specially, the respondents were not asked to give their mobile numbers or individual information which could have led to loss of solitude of the respondents. Ethics issues were included in this research. The tactic used in this study provided a framework that empirically addresses the identified research problem and summarizes how the study consequences can be generalized, replicated and used in prediction for effective decision making. The methodology adopted represents the population, instrumentation, sampling

procedure, and data collection approach used. It allows for description of the influence of Service quality, Perceived value, Customer care services, Loyalty on customer satisfaction among users of West Central India.

4.19 Data Collection

The research gathered both primary and secondary data. A survey questionnaire (Appendix 2) was incorporated to collect primary data from respondents. The questionnaire had six sections; the first section profiled the respondents to generate background information, the second section collected data on mobile service quality abstract, the third section sought data on perceived value (Tariff /Recharge) and the fourth section collected data on customer care services, fifth section gathered data on loyalty dimension and sixth section on overall satisfaction. The questionnaire had multiple choice questions (MCQs) and Likert scale questions. The structured questions were chosen because they minimized response distinction took less time to code and decipher and they led to enhanced response rate.

The variables in the instrument fell on the ordinal and interval measurement scale. The ordinal scale makes sure that the variables were mutually exclusive and collectively exhaustive of every class of response as well as that they showed the property of order. Since ordinal scales only allowed for explanation of gross order and not the comparative positional distances, an interval scale was then applied to make sure order, equidistant points between each of the scale elements and mutual exclusivity of each category. The rating scale used was a 5 point Likert type scale, where **"1" implied "Very Dissatisfied" and "5" implied "Very Satisfied".**

Secondary data collected from published sources (i.e. peer reviewed academic journals, web site of telecom companies, TRAI, DOT, etc.) on service quality, corporate care services, perceived value and customer satisfaction. Information was also gathered from Special Government reports including; TRAI, Economic surveys, Cellular Operators Association of India, Open Government Data Platform of India.

The samples were collected from three states (MP, Rajasthan and Gujarat). The targeted population was divided into three segments: **Urban, Semi-Urban and Rural**. The detail of all the three segments ix explained below:

Urban Samples: The detail of urban samples collected from all the three states, operator-wise is given in **Table 4.13**:

Table 4.13 Distribution of Urban Sample Service Provider and State wise

Distribution of Urban Sample Service Provider wise					
State	**District**	**Urban Sample**			
		City	**Service Provider**	**No of Samples**	**Total No of Samples**
Madhya Pradesh	Mandsaur	Mandsaur City	Idea	30	120
			Airtel	30	
			Vodafone	30	
			BSNL	30	
Gujarat	Dahod	Dahod City	Vodafone	30	120
			Idea	30	
			Airtel	30	
			BSNL	30	
Rajasthan	Kota	Kota City	Airtel	30	120
			Vodafone	30	
			Idea	30	
			BSNL	30	
Total Urban Samples					360

Semi-Urban Samples:

Collection of Semi-Urban Samples from various towns of Madhya Pradesh is represented in below **Table 4.14:**

Table 4.14 Distribution of Semi-Urban Sample Service Provider wise in MP

Distribution of Semi-Urban Sample Service Provider wise in MP					
State	**District**	**Semi Urban Samples**			
		City	**Service Provider**	**No of Samples**	**Total No of Samples**
Madhya Pradesh	Mandsaur	Bhanpura	Idea	10	40
			Airtel	10	
			Vodafone	10	
			BSNL	10	
		Garoth	Vodafone	10	40
			Idea	10	
			Airtel	10	
			BSNL	10	
		Sham Garh	Airtel	10	40
			Vodafone	10	
			Idea	10	
			BSNL	10	
Total Semi Urban Samples					120

Similarly Collection of Semi-Urban Samples from various towns of Gujarat is shown in **Table 4.15:**

Table 4.15 Distribution of Semi-Urban Sample Service Provider wise in Gujarat

Distribution of Semi-Urban Sample Service Provider wise in Gujarat					
State	**District**	**Semi Urban Sample**			
		City	**Service Provider**	**No of Samples**	**Total No of Samples**
Gujarat	Dahod	Dahod	Idea	10	40
			Airtel	10	
			Vodafone	10	
			BSNL	10	
		Jhalod	Vodafone	10	40
			Idea	10	
			Airtel	10	
			BSNL	10	
		Devgarh Baria	Airtel	10	40
			Vodafone	10	
			Idea	10	
			BSNL	10	
Total Semi Urban Samples					120

The distribution of Semi-Urban samples in Rajasthan state is elaborated in below **Table 4.16:**

Table 4.16 Distribution of Semi-Urban Sample Service Provider wise in Rajasthan

Distribution of Semi-Urban Sample Service Provider wise in Rajasthan					
State	**District**	**Semi Urban Sample**			
		City	**Service Provider**	**No of Samples**	**Total No of Samples**
Rajasthan	Kota	Ramganjmandi	Idea	10	40
			Airtel	10	
			Vodafone	10	
			BSNL	10	
		Kaithoon	Vodafone	10	40
			Idea	10	
			Airtel	10	
			BSNL	10	
		Sultanpur	Airtel	10	40
			Vodafone	10	
			Idea	10	
			BSNL	10	
Total Semi Urban Samples					120

Rural Samples:

Similarly the distribution of rural samples in MP, Gujarat and in Rajasthan is shown in below **Tables 4.17, 4.18** and **4.19** respectively:

Table 4.17 Distribution of Rural Samples Service Provider wise in MP

Distribution of Rural Samples Service Provider wise in MP					
State	**District**	**Rural Sample**			
		Village	**Service Provider**	**No of Samples**	**Total No of Samples**
Madhya Pradesh	Mandsaur	V-1	Idea	5	20
			Airtel	5	
			Vodafone	5	
			BSNL	5	
		V-2	Vodafone	5	20
			Idea	5	
			Airtel	5	
			BSNL	5	
		V-3	Vodafone	5	20
			Idea	5	
			Airtel	5	
			BSNL	5	
		V-4	Vodafone	5	20
			Idea	5	
			Airtel	5	
			BSNL	5	
		V-5	Vodafone	5	20
			Idea	5	
			Airtel	5	
			BSNL	5	
		V-6	Vodafone	5	20
			Idea	5	
			Airtel	5	
			BSNL	5	
Total Rural Samples					120

Table 4.18 Distribution of Rural Samples Service Provider wise in Gujarat

Distribution of Rural Samples Service Provider wise in Gujarat					
State	**District**	**Rural Sample**			
		Village	**Service Provider**	**No of Samples**	**Total No of Samples**
Gujarat	Dahod	V-1	Idea	5	20
			Airtel	5	
			Vodafone	5	
			BSNL	5	
		V-2	Vodafone	5	20
			Idea	5	
			Airtel	5	
			BSNL	5	
		V-3	Vodafone	5	20
			Idea	5	
			Airtel	5	
			BSNL	5	
		V-4	Vodafone	5	20
			Idea	5	
			Airtel	5	
			BSNL	5	
		V-5	Vodafone	5	20
			Idea	5	
			Airtel	5	
			BSNL	5	
		V-6	Vodafone	5	20
			Idea	5	
			Airtel	5	
			BSNL	5	
Total Rural Samples					120

Table 4.19 Distribution of Rural Samples Service Provider wise in Rajasthan

Distribution of Rural Samples Service Provider wise in Rajasthan					
State	**District**	**Rural Sample**			
		Village	**Service Provider**	**No of Samples**	**Total No of Samples**
Rajasthan	Kota	V-1	Idea	5	20
			Airtel	5	
			Vodafone	5	
			BSNL	5	
		V-2	Vodafone	5	20
			Idea	5	
			Airtel	5	
			BSNL	5	
		V-3	Vodafone	5	20
			Idea	5	
			Airtel	5	
			BSNL	5	
		V-4	Vodafone	5	20
			Idea	5	
			Airtel	5	
			BSNL	5	
		V-5	Vodafone	5	20
			Idea	5	
			Airtel	5	
			BSNL	5	
		V-6	Vodafone	5	20
			Idea	5	
			Airtel	5	
			BSNL	5	
Total Rural Samples					120

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Chapter – V
Data analysis and Discussion

5.1 Telecom Services Statistics of States of West-Central India under Study

The former discussions provide a apparent picture about the customer satisfaction resulted by experiencing mobile services (GSM) of public sector telecom service provider BSNL and private sector telecom service providers in West Central Indian region. The telecom service providers accomplished many strategic marketing initiatives, which in turn gave rise to transform the telecom services sector. The service innovations and marketing strategies settle on the fortune of service providers. Many of the late entrants acquired the foremost market share of mobile telecom services sector of this region by enchasing the market opportunities and providing quality services (e.g. Reliance Jio). The analysis of primary data confirms that the quality of service significantly differs between BSNL and private sector telecom service providers. This chapter summarized the findings of the study on the basis of the analysis of data. The mobile subscriber base in the region, under study, as on 31st March 2017 operator wise statistics is shown in **Table 5.1**

Table 5.1 Operator Wise Customer Base with % Market Share (as on 31.03.17)

Name of Circle		Gujarat	Madhya Pradesh	Rajasthan
Name of Operator	BSNL	5963925	5917103	6165874
	Market Share (%)	**8.15**	**8.38**	**9.05**
	Bharti	9262239	14264675	21112698
	Market Share(%)	**12.65**	**20.20**	**31.00**
	Reliance	5514940	9237392	5639710
	Market Share(%)	**7.53**	**13.08**	**8.28**
	Vodafone	20055792	6814919	12304829
	Market Share(%)	**27.40**	**9.65**	**18.07**
	Tata Tele	2561332	4210823	1076378
	Market Share(%)	**3.50**	**5.96**	**1.58**
	Idea	13163074	24031263	8389292
	Market Share(%)	**17.98**	**34.04**	**12.32**
	Aircel	17063	20694	6680710
	Market Share(%)	**0.02**	**0.03**	**9.81**
	Sistema Shyam	132022	0	1358516
	Market Share(%)	**0.18**	**0.00**	**1.99**
	Reliance Jio	8055148	6106473	5370687
	Market Share(%)	**11.00**	**8.65**	**7.89**

On further analyzing the data, it can be seen that the Market share of BSNL is between 8 to 9 % in all the three states which is lowest among the four operators being studied. The Tele density was found highest in Gujarat at 99% and lowest in MP at 64% only. The comparative market share of telecom operators is also shown in above table.

On analyzing, It was observed that in Gujarat state, Vodafone stood at first position among all the operators with a market share of 27.40 %. Similarly in Madhya Pradesh, Idea Cellular is Market leader with 34.05 % market share while the case of Rajasthan, Bharti Airtel was Top service provider with market share of 31.00 %.

It is clear from the analysis that three different operators are enjoying market leadership in three states (i.e. Rajasthan, Madhya Pradesh and Gujarat.) individually.

More than 70% of customer base of mobile telecom services market is vested with the telecom giants: Idea, BSNL, Vodafone and Airtel which are undertaken in this study. The remaining minor fraction of the telecom market is shared by the other remaining service providers like Reliance, Tata, MTS, Aircel, Uninor, Videocon , Sistema Shyam and Reliance Jio.

The public sector service provider BSNL along with the three main private sector telecom service providers Idea, Vodafone and Airtel are primarily considered for the data analysis pertaining to the comparative study of customer satisfaction in the telecommunication services sector. The mobile telecom service providers differentiated their services based on service benefits, customer support services, quality of service, brand value, pricing strategies, and promotional strategies.

5.2 Distribution of Samples

In following section various aspects of samples are explored.

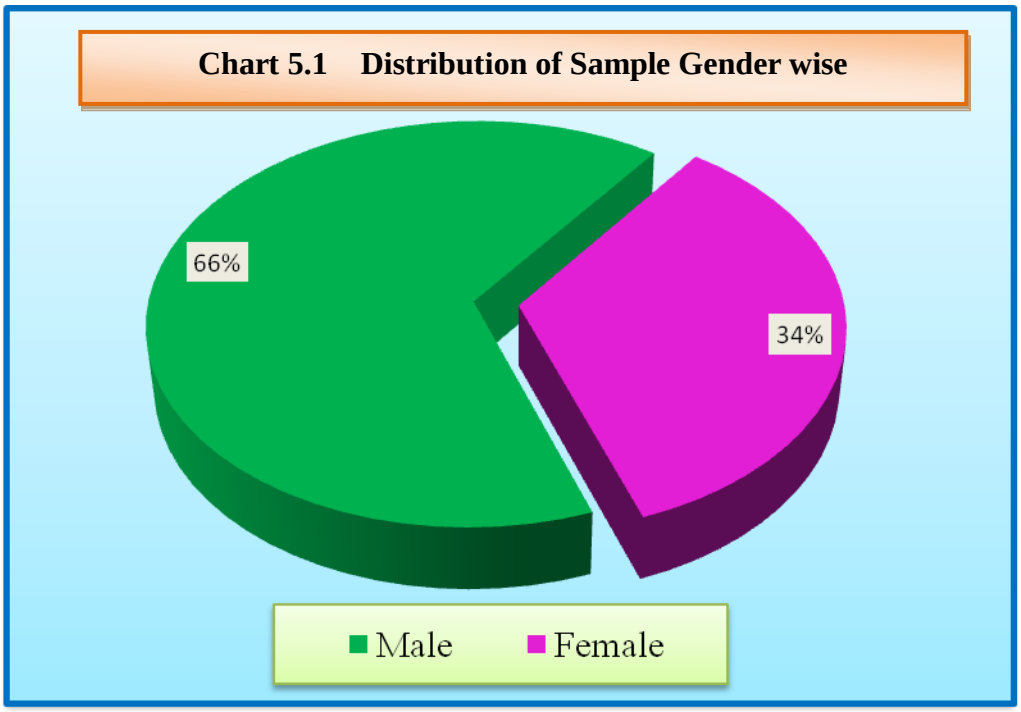
a. Gender Wise

Along with locality, the demographic variables of sample respondents collected for the study are name of service provider, age group, gender and monthly expenditure, number of times MNP exercises, getting promotional offers etc. The distribution of sample respondent's gender wise is represented in **Table 5.2** and graphically represented in **Chart No.5.1.**

Table 5.2 Distribution of Sample Gender wise

Gender	Frequency	Percent
Male	709	65.64
Female	371	34.36
Total	**1080**	**100**

It shows that there are 65.6% are male and 34.4% are female



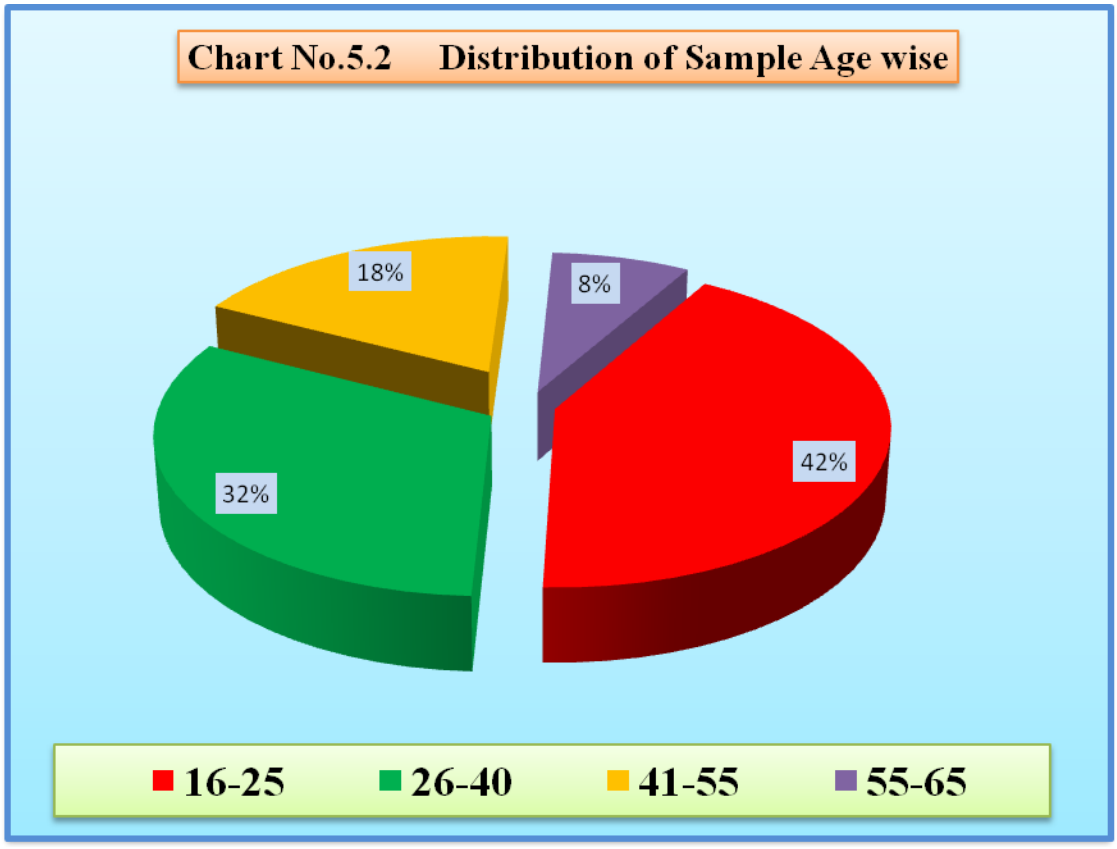
b. Age Wise

The distribution of sample respondents by age group is given in the **Table 5.3** and graphically represented in **Chart No.5.2.** It shows that nearly 41% of the respondents belonging to the age group up to 25 years.

Table 5.3: Distribution of Sample Age wise

Age Group (in Years)	Frequency	Percent
16-25	457	42.31
26-40	345	31.94
41-55	197	18.24
55-65	81	7.5
Total	**1080**	**100**

The data related to educational qualification and employment status were not collected as generally respondents hide such personal information. Further, collections of this data were not required to conduct this study.

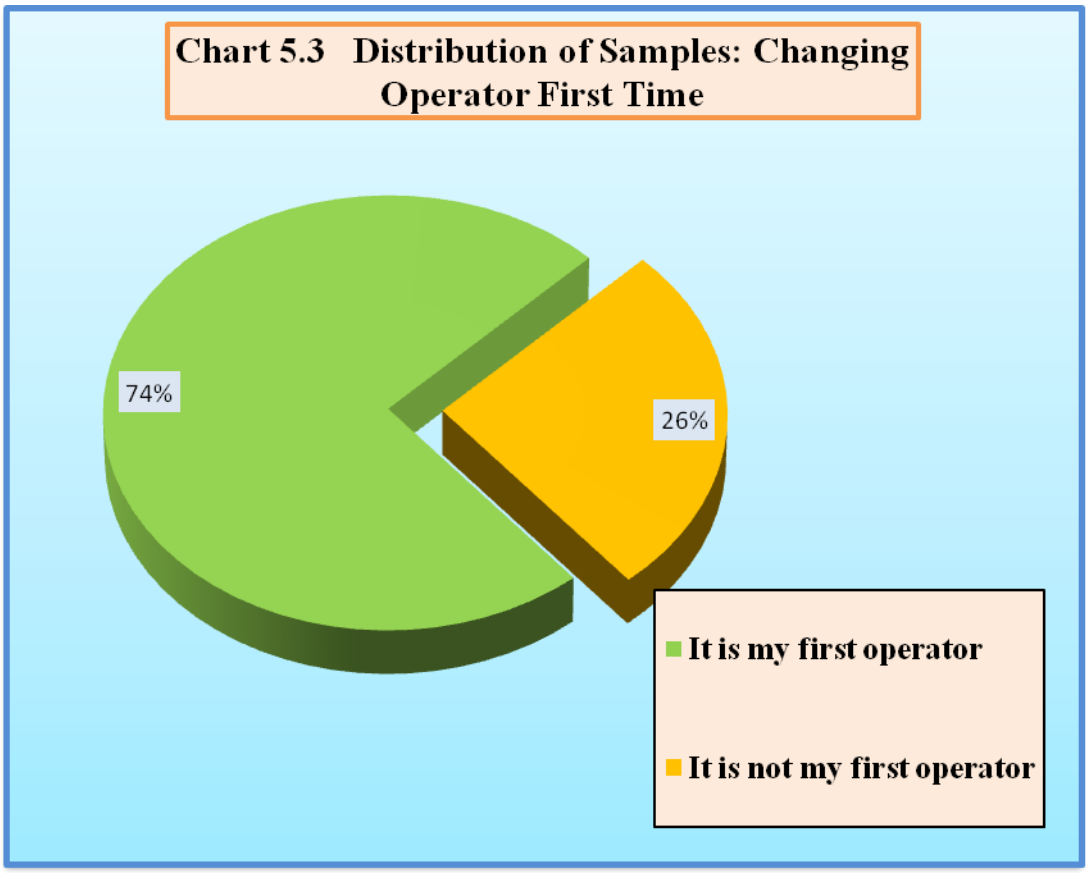


c. Responses Recorded on MNP (Mobile Number Portability) Option Exercised

The next question was associated to MNP (Mobile Number Portability. It is a facility to change service provider without changing mobile number. The aim of this question was to investigate inside the dissatisfaction regarding services. Therefore it was asked to respondents to reply that how many times they changed the service provider. The respondents were asked whether it is their first service provider or not. The reason behind it was to know that how many respondents had switched service provider. It is clear from the data that 27.97 % respondents exercised MNP (Mobile Number Portability) option. Remaining 72.03 % respondents were stick to their first operator. The distribution of sample in this regard is shown in given **Table 5.4** and graphically represented in Chart **No.5.3**

Table 5.4 Distribution of Samples: Changing Operator First Time

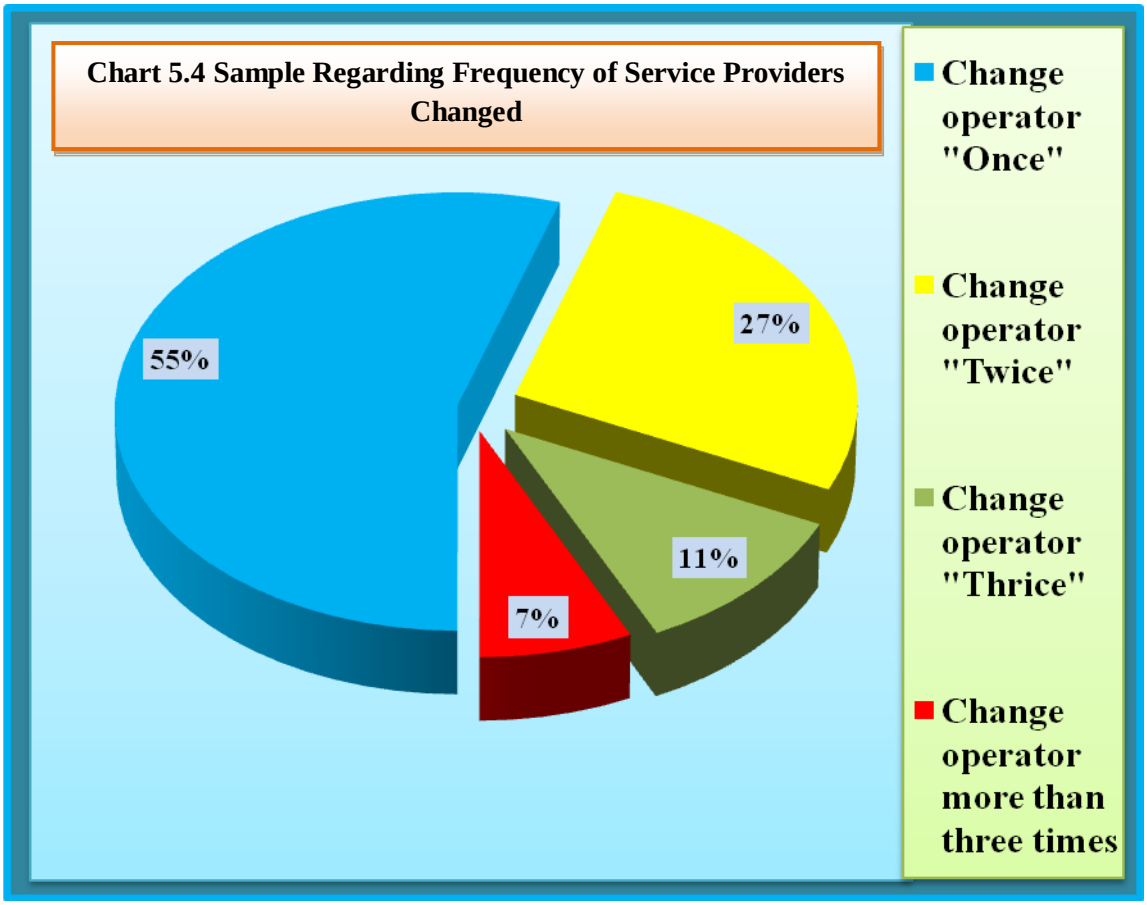
Reply of Respondents	Frequency	%
It is my first operator	796	73.7
It is not my first operator	284	26.3
Total	**1080**	**100**



Further the data was analyzed on the basis of frequency of exercising MNP option. It was interesting to see here that approx 7% respondents have changed operator more than three times. It shows that they did not found services of previous three operators satisfactory. Similarly 54% respondents changed operator first time, 27 .18 % respondents two times and 11.15 % respondents three times. The sampling distribution is given in **Table 5.5** and graphically represented in **Chart No.5.4.**

Table 5.5 Distribution of Sample Regarding Frequency of Service Providers Changed

Reply of respondents	Frequency	Percent
Change operator "Once"	156	54.93
Change operator "Twice"	77	27.11
Change operator "Thrice"	31	10.92
Change operator more than three times	20	7.04
Total	**284**	**100**

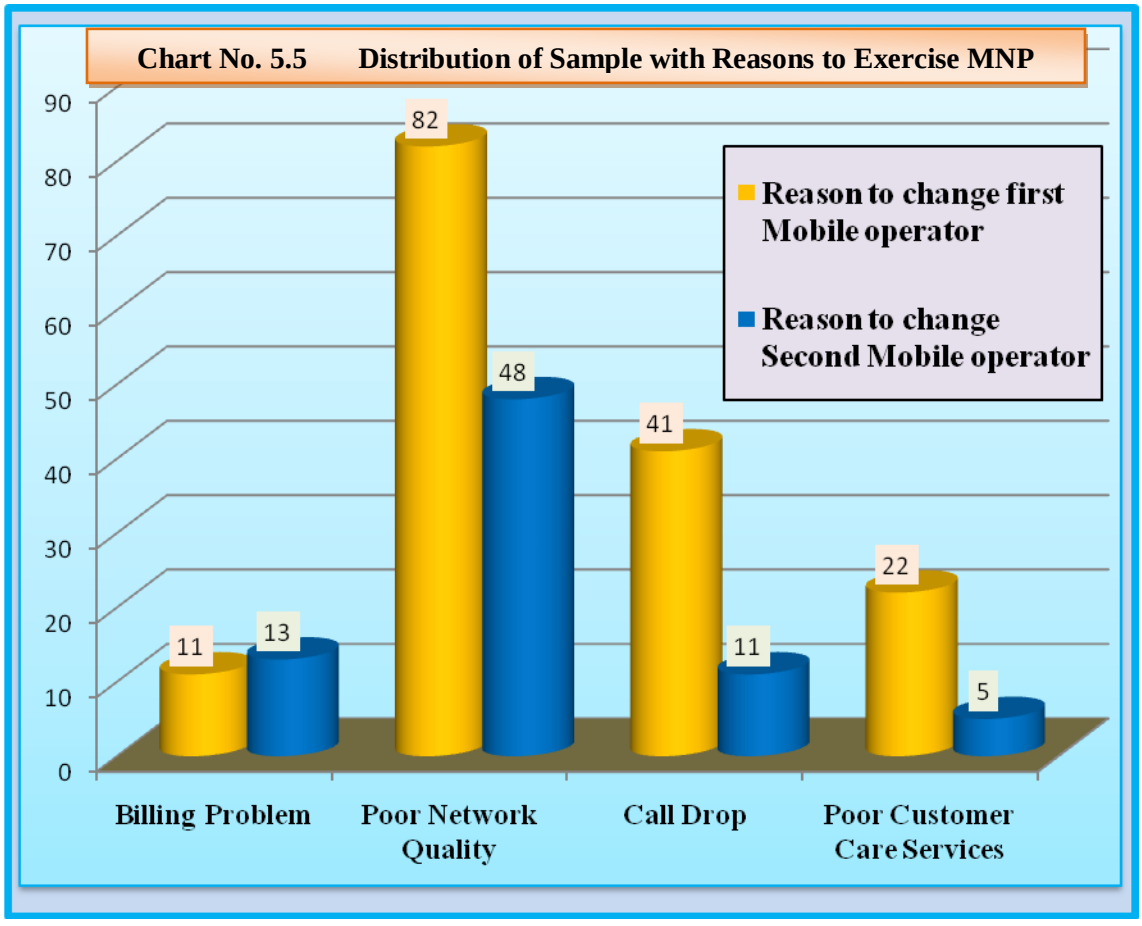


d. MNP (Mobile Number Portability) : Reasons-wise

It was further analyzed that what are reasons behind changing operators frequently by customers. These are shown in **Table 5.6** and graphically represented in **Chart No.5.5**.

Table 5.6 Distribution of Sample analyzing reasons to exercise MNP option

Parameter	Billing Problem		Poor Network Quality		Call Drop Problem		Poor Customer Care Services		Total
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	
Reason behind changing first Mobile operator	11	7.05	82	52.56	41	26.28	22	14.10	156
Reason behind changing Second Mobile operator	13	16.88	48	62.34	11	14.29	5	6.49	77



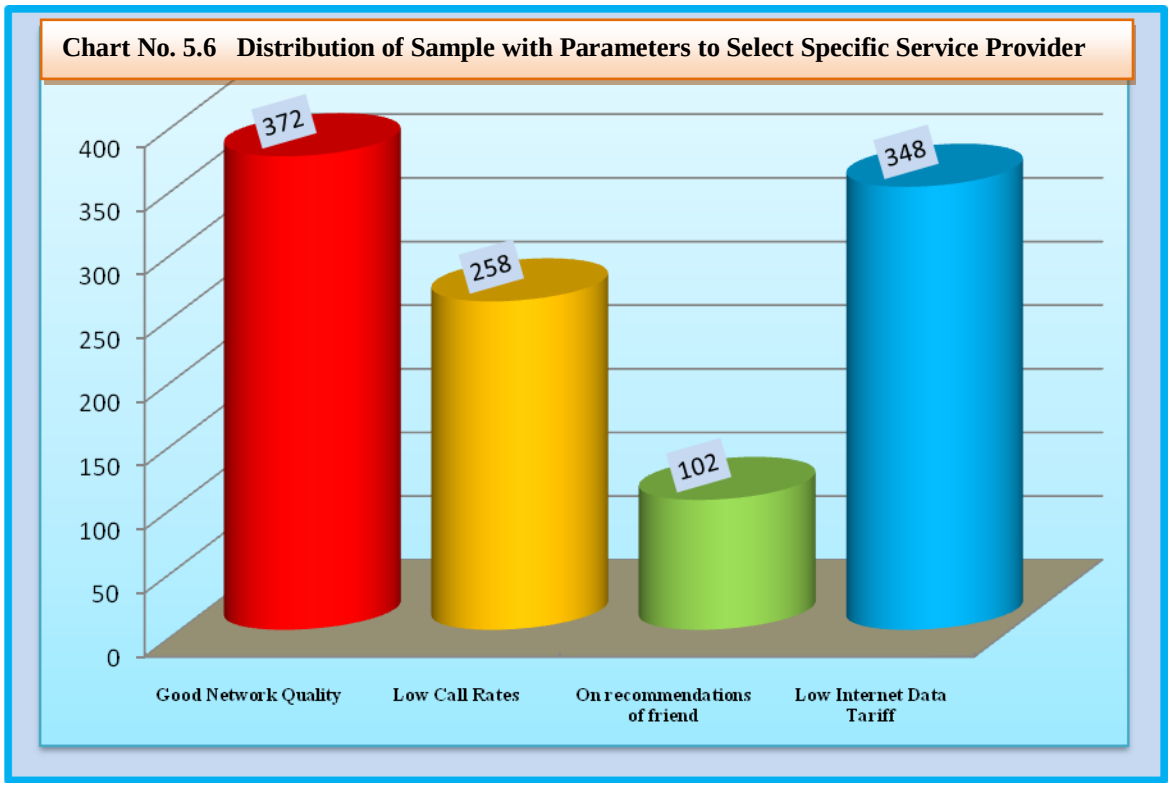
It is clear from above table that most of the respondents do exercise MNP option due to poor network quality and call drops.

e. Major Parameters for Selecting of Service Provider

Further the respondents were asked about what they desire the most while selecting service provider. The statistics of responses recorded is displayed below in **Table No 5.7** and graphically represented in **Chart No.5.6**.

Table 5.7 Distribution of Sample with Parameters to Select Specific Service Provider

Parameter	Good Network Quality		Low Call Rates		On Recommendations of Friend		Low Internet Data Tariff		Total
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	
What do you check first while choosing mobile operator	372	34.4	258	23.9	102	9.44	348	32.2	1080



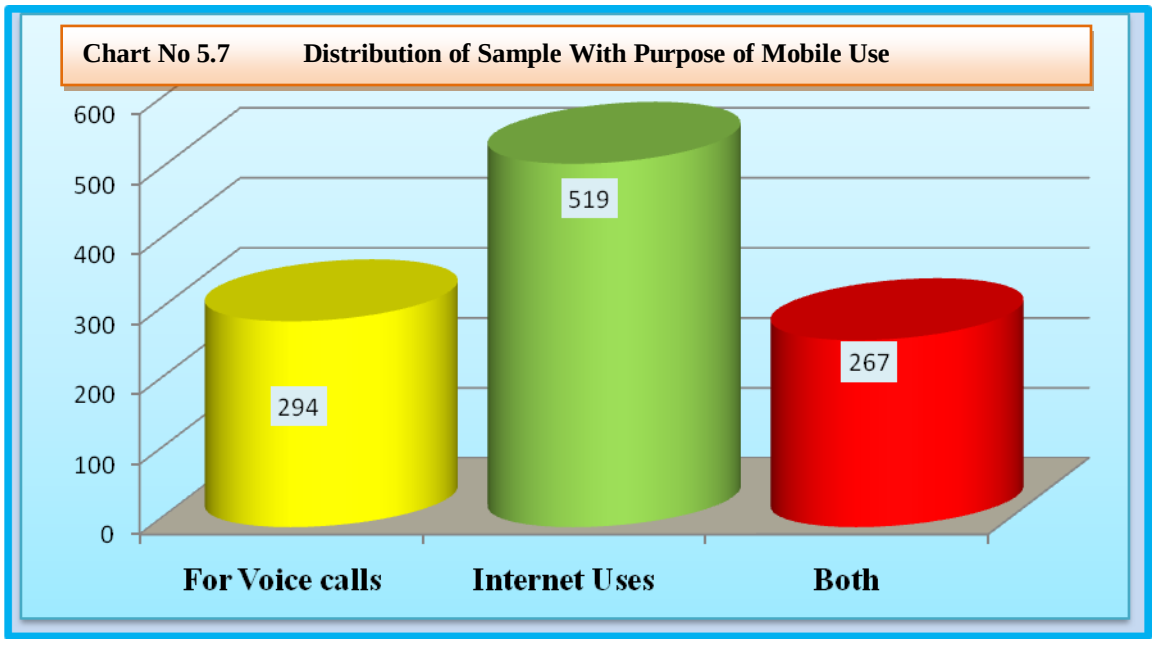
It can be concluded from the data that 34.44 % subscribers search for network quality 32.22 % subscribers go for Low Data rates, 23.89 % subscribers choose for Low Call rates and only 9.44 % follow recommendations of friends etc.

f. Purpose of Using Mobile Phone

The next question was related to use of Mobile phone that for what purpose respondents use mobile phone. Basically there are two major uses: One for Voice calls and another for Data/Internet. The data collected in this regard is shown in **Table 5.8** and graphically represented in **Chart No.5.7.**

Table 5.8 Distribution of Sample with purpose of mobile use

Parameter	For Voice calls		Internet Uses		Both		Total
	Frequency	%	Frequency	%	Frequency	%	
For what purpose you use the mobile most	294	27.22	519	48.06	267	24.72	1080



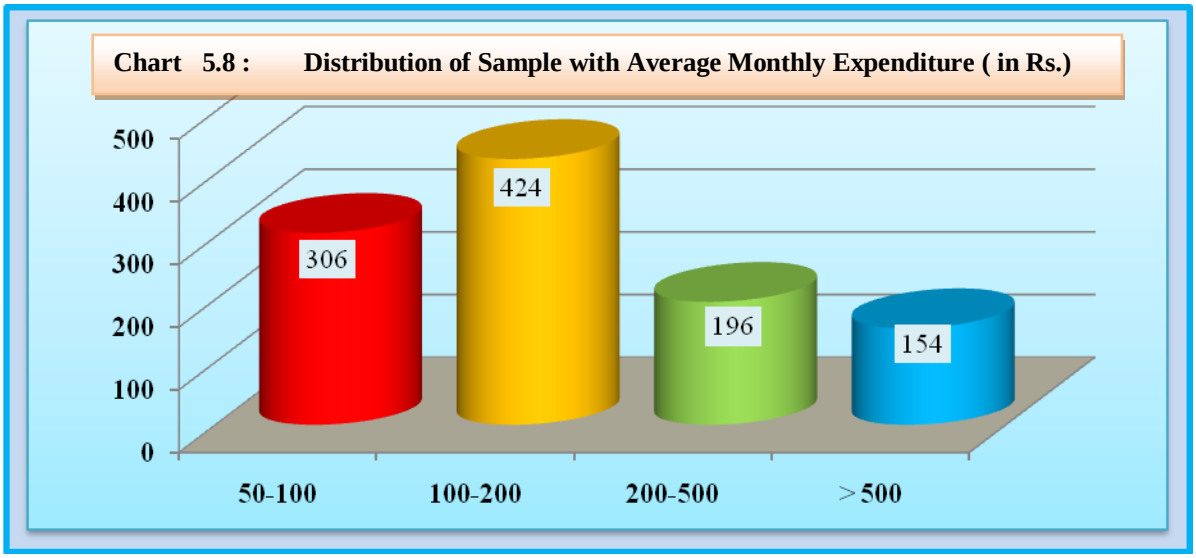
It is clear from table those 48 % subscribers are using mobile phone for Internet services only. Only 27.22% are using for voice calls only and 24.72 % for both internet and voice calls. It shows that data services are dominating voice services. In the days to come, more subscribers will shift towards internet services due to government focus on digital India program and cashless economy.

g. Monthly Expenditure on Mobile Phone :

In the questionnaire next question was relate to monthly expenditure on mobile use. The replies received from subscribers are summarized and shown in **Table 5.9** and graphically represented in **Chart No.5.8.**

Table 5.9 : Distribution of Sample with Average Monthly Expenditure

Parameter	Rs 50-100		Rs.100-200		Rs. 200-500		Rs. > 500		Total
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	
Your monthly expenditure on Mobile is (Rs.)	306	28.33	424	39.26	196	18.15	154	14.26	1080



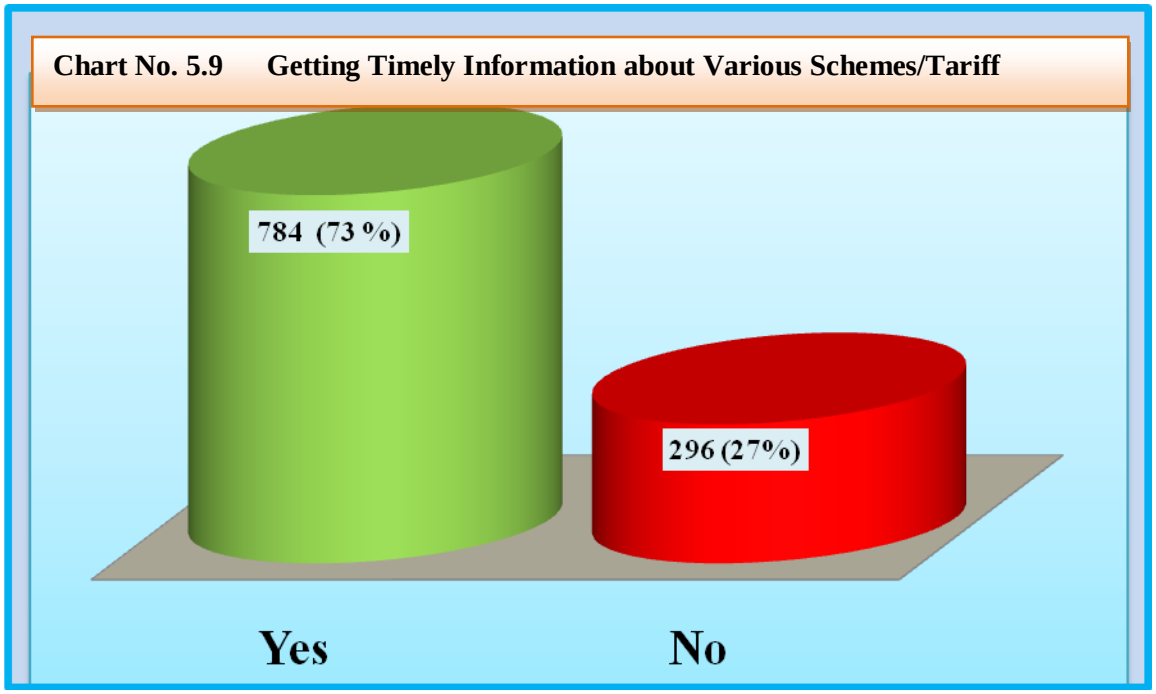
It can be concluded from the table that 39.26 % respondents spending Rs 100-200 in a month, the expenditure of 28.33 % users is in between Rs.50-100, 39.26% users are making expenditure of Rs.100-200 and only 14.26% respondents are paying > Rs.500 on telecom services. It is clear from the table that expenditure of 68% respondents in below Rs.200. Therefore the service providers should design such type of offerings which are capable to attract this class.

h. Receiving Timely Information of Promotional Offers etc

The last question in Appendix A was regarding getting latest timely information on tariffs updates, new offerings; promotional plans etc. The analysis of data captured on this parameter is shown in **Table 5.10** and graphically represented in **Chart No.5.9**.

Table 5.10 : Distribution of Sample Regarding Getting Timely Information of Promotional Offers etc.

Parameters	Yes		No	
	Frequency	%	Frequency	%
Did you timely information about various schemes/tariff changes/ promotional offers	784	72.59	296	27.41



72.59 % respondents replied that they are getting timely information about promotional plans and other tariff offering. Rests were not satisfied with this service of their respective operators. Therefore here again operator can put efforts to communicate their offerings to customers timely in efficient way. It will be helpful for customers as well as for company.

5.3 Empirical Data Reliability and Validity Testing:

A Pilot study was done with a small sample size of 88 to clarify the overall structure of questionnaire as explained in section 4.15.3. The respondents provided comments on clarity of all items and confirmed face validity of items in the questionnaire. To confirm this it, Content validity questionnaire was sent to industry experts who were familiar with the construct being measured. Their feedback was then analyzed and necessary corrections were made.

In this survey, there were total 1080 feedbacks collected from sample population. All the feedbacks were complete, i.e. no missing data in the questionnaires. For the five constructs, study focused on, it was necessary to measure internal reliability of each construct with its different number of items. To test the internal reliability, the Cronbach's alpha was calculated for items designed for the same construct. If the items are multi-dimensional, Cronbach's alpha will generally be low, in which case, it can either make use of factor analysis or the correlation matrix of the items to select a subset of items that tend to be one-dimensional. For the five constructs we had, all of them had Cronbach's alphas larger than 0.6 (a level considered "acceptable" in most social science research). The calculated values of Cronbach's alpha for all the six constructs of questionnaire extracted from responses of all the 1080 survey feedback is represented in **Table 5.11**

Table 5.11 Cronbach's Alpha for Six Constructs of Questionnaire

S. No.	Construct	Cronbach's Alpha	Number of Items
1	Measure of Network Quality	**0.69**	6
2	Measure of Perceived Value	**0.73**	11
3	Measure of Customer Care Services	**0.65**	7
4	Measure of Customer Loyalty	**0.69**	2
5	Measure of Overall Satisfaction	N/A	1
6	Measure of Complete Questionnaire	**0.78**	27

It indicates that the internal reliability/consistency of these entire five construct is good and overall measure of Cranach's alpha for entire questionnaire calculated 0.78 which is sign of very good internal consistency.

5.4 Empirical Data Analysis:

After testing the reliability of the items, it needs to take the averaged scores of items for each construct as the final scores are very important, upon which we conduct further analysis. The findings will involve summary of statistics which includes mean, standard deviations, median, mode, sample variance, Kurtosis and Skewness for all the constructs of data of Madhya Pradesh, Rajasthan and Gujarat states. In the discussion, all the terms are very common and often used in statistical analysis except Kurtosis and Skewness. Therefore it is essential to define Skewness and Kurtosis.

Skewness: According to Simpson and Kafka "Measure of skewness tell us the direction and extent of skewness. In a symmetrical distribution, the mean, median and mode are identical. The more the mean moves away from the mode, the larger the asymmetry or skewness.

Kurtosis: It reflects to the degree of flatness or peakness in the region about the mode of a frequency curve. If a curve is more peaked than normal curve, it is called *"leptokurtic"*. If a curve is more flat topped than normal, it is called "*platukurtik"*. The normal curve itself is known as *"mesokurtik"*.

The summary of statistics of complete data of west central Indian region which includes 1080 samples has been represented in **Table 5.12**. Some abbreviations are used in this table. The explanation is as under:

PNQ (Perceived Network Quality): It is average of responses regarding network quality experienced by customers under study.

PV (Perceived Value): These are facilities/returns which a customer gets in terms of benefits by recharging his phone by means of various Top-up vouchers (To increase main balance), Plan vouchers (To select per minute of per second plan), and Special tariff vouchers (To avail reduced tariff for voice calls and various data packs)

CCS (Customer Care Services): When a customer approaches call centre through a toll free number or IVRS (Interactive voice response System) ,different kind of services offered by all the operators to facilitate their customer to inform them various schemes, tariffs plans, MNP, rectification of subscribers complaints etc

OA_{SAT}: As a part of questionnaire, there was a question to rate overall satisfaction on five point Likert scale. The average calculated of this parameter is shown under this column.

OALL: Under this column, average of all the 27 questions in has been taken into account. In further data analysis this parameter has been taken into consideration for comparison of various constructs w.r.t. overall customer satisfaction as it is more reliable and accurate.

Table 5.12: Summary of Statistics of Sample Data of West Central Indian Region

PNQ	PNQ	PV	CC	CL	O_All
Mean	3.143	3.164	3.272	3.177	3.189
Standard Error	0.017	0.014	0.016	0.025	0.011
Median	3.167	3.182	3.286	3.000	3.192
Mode	3.167	3.091	3.429	3.000	3.269
Standard .Dev	0.561	0.461	0.533	0.810	0.355
Sample Vari.	0.315	0.212	0.284	0.657	0.126
Kurtosis	0.216	-0.430	7.133	-0.213	-0.058
Skewness	-0.152	-0.021	0.527	-0.301	0.072
Range	3.500	2.818	6.286	4.000	2.231
Minimum	1.333	1.545	1.286	1.000	2.192
Maximum	4.833	4.364	7.571	5.000	4.423
Sum	3394.8	3416.7	3534.1	3431.5	3444.4
Count	1080	1080	1080	1080	1080

All the six constructs have means that are more than half of the scale of the centre of scales. The sample standard deviation of Customer loyalty (0.81) is relatively higher. It is due to wide perception of respondents about this constructs. The mean value of other constructs ranges from 0.35 to 0.56. All the constructs are negatively skewed except **OA_{SAT}** and Customer Care Services.

5.5 Hypotheses

As mentioned in chapter at section 4.6, following hypothesis were proposed to test various aspects of this research.

H_{01} There is no significant relationship between Network Quality and Customer Satisfaction among customers of different Mobile Telecommunication service providers in India.

H_{02} There is no significant relationship between Perceived Value (Value for Money) and Customer Satisfaction among customers of different Mobile Telecommunication service providers in India**.**

H_{03} There is no significant relationship between Customer Care Services & Customer Satisfaction among customers of different Mobile Telecommunication service providers in India

H_{04} There is no significant relationship between Customer Loyalty & Customer Satisfaction among customers of different Mobile Telecommunication service providers in India.

H_{05} There is no difference in Network Quality being provided by different Mobile Telecommunication service providers in India.

H_{06} There is no difference in Perceived Value (Value for Money) being experienced by customers of different Mobile Telecommunication service providers in India**.**

H_{07} There is no difference in Customer Care Services being experienced by customers of different Mobile Telecommunication service providers in India**.**

H_{08} There is no difference in Customer Loyalty among different Mobile Telecommunication service providers in India.

H_{09} There is no difference in overall customers Satisfaction being experienced by customers of different Mobile Telecom Service Providers in India.

The first four Hypotheses i.e. **H_{01}** to **H_{04}** were tested using **correlation analysis**.

Here "**Spearman's Rank correlation"** coefficient was used for correlation analysis. In following section, some insight about Spearman's Rank correlation coefficient has been described.

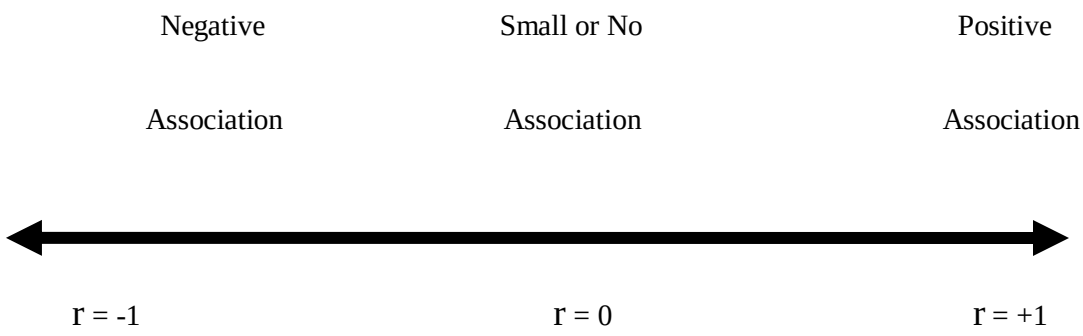
The Spearman's Rank Correlation Coefficient

It is used to make out and test the power of a relationship between two sets of data. It is frequently used as a statistical method to facilitate with either accepting or rejecting a hypothesis. The formula used to calculate Spearman's Rank is shown below.

$$r = 1 - 6 \sum d^2 / (n^3 - n)$$

Interpretation of r : The same has been shown in **Fig 5.1**

Fig 5.1 Interpretation of " r"



When the correlation coefficient is above "0.0", then it provides confirmation of a positive relationship between two parameters say X and Y. That is, if " r" > 0, larger values of X are linked with larger values of Y. If "r" is close to "1.0", this describes a big positive relationship between the two variables. The correlation coefficient is formed so that it is always between -1.0 and +1.0. When "r" is close to "0" this means that there is small association between the variables and the beyond away from "0". "r" is, in either the positive or negative direction, the better the relationship between the two variables.

Correlation describes the strength of the correlation. Using the following guide for the absolute value of Spearman's correlation strength can be judged (See Table 5.13)

Table: 5.13 Strength of Correlation Factor "r"

Value of " r"	Interpretation
0.00-0.19	"Very weak"
0 .20-0.39	"Weak"
0.40-0.59	"Moderate"
0.60-0.79	"Strong"
0.80-1.00	"Very strong

Here we shall use Spearman's correlation matrix with two tailed test of statistical significance at 0.05 levels to find out the strength of association and the consistency of the relationship between the constructs.

5.6 Testing of Hypothesis: H_{01} to H_{04}

First four Hypotheses were formed to judge the relationship between Network Quality, Perceived Value, Customer Care Services and Customer loyalty with Customer Satisfaction. To test these four Hypotheses **Spearman's Rank correlation coefficient** was used. The first hypothesis was most important from customer's point of view. Every customer who wants to avail mobile services, first searches for quality of network, being provided by service providers around his/her residence and/or work place. The prospective customer seeks help of friends, neighbours, relatives and retailers of various service providers in surrounding areas to select the best operator. To conduct this analysis, 1080 samples were collected from the four major operators i.e. BSNL, Airtel, Vodafone and Idea in Rajasthan, Madhya Pradesh and Gujarat states. To extract fruitful information, sufficient numbers of samples were collected. 360 samples were collected from each state, which included 90 samples from each BSNL, Airtel, Vodafone and Idea

operators. The detail of questionnaire and all of its constructs is reiterated below **Table 5.14**

Table 5.14: Summary of Constructs of Questionnaire

SN	Construct	No. of Items	Cumulative Items
1	Network Quality	6	6
2	Perceived Value (Tariff /Recharge)	11	17
3	Customer Care	7	24
4	Customer Loyalty	2	26
5	Overall Satisfaction	1	27

The first hypothesis was stated as below:

H_{01} There is no significant relationship between Network Quality and Customer Satisfaction among customers of Mobile Telecommunication service providers in India.

As mentioned above, to test first hypothesis, Spearman's correlation analysis was applied. There were six items in this construct related to **"Network Quality".** The 1080 respondents submitted their opinion regarding network quality on five point Likert Scale through structured questionnaire. In this scale, "1" represented 'strongly disagree' (the most unfavourable response to the statement) and "5" represented 'strongly agree' (the most favourable response to the statement). Further the average of all the six items was calculated of all the 1080 respondents.

The Spearman's Correlation analysis was applied and results are shown in **Table 5.15**

Table 5.15: Spearman's Correlation Analysis to Test H_{01}

Parameters	Perceived Network Quality	Overall Sat.
Perceived Network Quality	1	
Overall satisfaction	**0.765**	1
n= 1080		

It is evident with the **Table No.5.15** that calculated value of **"r"** is **0.765**, which lies in between 0.60 to 0.79. Therefore it can be concluded that there is there is "**strong positive"** relationship between **"Network Quality"** and **"Overall satisfaction". Therefore hypothesis was rejected and it was concluded that there is significant relationship between Network Quality and Customer Satisfaction among customers of Mobile Telecommunication service providers in India.**

Testing of Hypothesis - H_{02}

This hypothesis tests relationship of perceived value with overall satisfaction of customer. The perceived value is nothing but it is facility/returns which a customer gets in terms of benefits by recharging his mobile phone by means of various Top-up vouchers (To increase main balance), plan vouchers (To select per minute of per second plan etc.), special tariff vouchers (To avail reduced tariff for voice calls and various data packs). Various operators provide offers in different forms. It may be free minutes, free seconds, free data, free usage value, top up of main balance, free or differentiated calling in odd hours, reduced or free calling in CUG, friend and family calling facility and so on.

With the help of this hypothesis, researcher tried to establish relationship between perceived value and overall Customer Satisfaction. This test was also conducted on all the 1080 samples collected in west central India region which included Rajasthan, Madhya Pradesh and Gujarat. The hypothesis was stated as:

H_{02} There is no significant relationship between Perceived Value (Value for Money) and Customer Satisfaction among customers of Mobile Telecommunication service providers in India.

To test this hypothesis, Spearman's correlation analysis was applied on 1080 samples collected across the three states of West Central India. The result of this test has been provided in following **Table 5.16**

Table 5.16: Spearman's Correlation Analysis to Test H_{02}

Parameters	**Perceived Value**	Overall satisfaction
Perceived Value	1	
Overall satisfaction	**0.8435**	1
n= 1080		

It is evident with the **Table No.5.16** that calculated value of **"r"** is **0.84**, which lies in between 0.8 to 1.0. Therefore it can be concluded that there is there is **"Very strong positive"** relationship between **"Perceived Value"** and **"Overall satisfaction".**

Therefore hypothesis was rejected and it was concluded that there is significant relationship between Perceived Value (Value for Money) and Customer Satisfaction among customers of Mobile Telecommunication service providers in India.

Testing of Hypothesis - H_{03}

This hypothesis tests relationship of customer care services with overall satisfaction of customers. Customer care services are nothing but different kind of services offered by all the operators to facilitate their customer when a customer approaches their call centre through a toll free number or IVRS (Interactive voice response System) to get information about various schemes, tariffs plans, MNP etc . Customer also approaches call centres for replacement of SIMs, duplicate SIMs, to know balance and validity, to get information about deduction in balance due to various reasons, to lodge complaint related to various services, activation of unwanted VAS etc. The hypothesis was stated as:

H_{03} There is no significant relationship between Customer Care Services & Customer Satisfaction among customers of Mobile Telecommunication service providers in India

To test this hypothesis, also data collected from all 1080 samples were analyzed using SPSS V22.0 and Spearman's correlation analysis was applied. The test statistics is provided in **Table 5.17**.

Table 5.17: Spearman's Correlation Analysis to Test H_{03}

Parameters	**Customer Care**	Overall Satisfaction
Customer Care Services	1	
Overall satisfaction	**0.38**	1
n= 1080		

It is evident with the **Table No.5.17** that calculated value of **"r"** is **0.38**, which lies in between 0.20 to 0.40 Therefore it can be concluded that there is there is **"Weak"** relationship between **"Customer Care Services"** and **"Overall satisfaction".**

Therefore hypothesis was accepted and it was concluded that there is no significant relationship between Customer Care Services & Customer Satisfaction among customers of Mobile Telecommunication service providers in India.

Testing of Hypothesis - H_{04}

This hypothesis tests relationship of customer loyalty with overall satisfaction of customers. Customer loyalty is an intention that customer devote to a brand or a product. Service quality factors influences on customer loyalty. It is "*an intended behaviour caused by the service and operationalised loyalty as a repurchase intention and willingness to provide positive word-of-mouth".* Even after some deficiencies in service delivery, customers keep subscribing their existing company. The hypothesis was stated as below:

H_{04} There is no significant relationship between Customer Loyalty & Customer Satisfaction among customers of Mobile Telecommunication service providers in India.

The test statistics is represented in **Table 5.18**

Table 5.18: Spearman's Correlation Analysis to Test H_{04}

Parameters	Customer Loyalty	Overall satisfaction
Customer Loyalty	1	
Overall satisfaction	0.5876	1
n= 1080		

It is evident with the **Table No.5.18** that calculated value of **"r"** is **0.58**, which lies in between 0.40 to 0.59. Therefore it can be concluded that there is there is **"Moderate Positive"** relationship between **"Customer Loyalty"** and "**Overall satisfaction".**

Therefore hypothesis was rejected and it was concluded that significant relationship between Customer Loyalty & Customer Satisfaction among customers of Mobile Telecommunication service providers in India.

5.7 Hypothesis Testing H_{05} to H_{09}:

These five hypotheses were analyzed using ANOVA statistical analysis (detail given below). Group means were calculated and compared. Broadly there are three groups which are three states of West Central India i.e. Madhya Pradesh, Rajasthan and Gujarat. Further these broad groups were sub divided on the basis of service providers. In each state, four service providers were selected who were enjoying major customer base. For

uniformity, BSNL, Airtel, Idea and Vodafone were selected in all the three states under study. Due to resource constraint only one district in each state was selected. The districts were selected through purposive sampling. These are Kota from Rajasthan, Mandsaur from Madhya Pradesh and Dahod from Gujarat. The detailed statistics about sample collections has been described in Chapter- IV at 4.15.

In order to empirically assess $\mathbf{H_{05}}$ to $\mathbf{H_{09}}$, whether there is a significant difference in overall network quality, perceived value, Customer Care Services, Customer Loyalty and customer satisfaction between various operators we used independent **ANOVA** (the parametric equivalent of the t-test for more than two groups). This test was applied when it is required to test more than two large groups (n > 30) simultaneously. It is a statistical technique specially designed to test whether the means of more than two quantitative populations are equal or not. This technique developed by R.A. Fisher in 1920. It is widely applied to variety of practical problems. After observing significant difference **Post-Hoc** test was applied.

ANOVA Assumptions

There are some assumptions that should be met before using ANOVA:

- The observations/samples are to be chosen from a random sample and they are independent from each other.
- The observations/samples are assumed to be normally distributed within each group
- ANOVA is still appropriate if this assumption is not met but the sample size in each group is large (> 30)
- The variances are approximately equal between groups

- If the ratio of the largest SD / smallest SD < 2, this assumption is considered to be met.
- It is not required to have equal sample sizes in all groups

One-way and Two-way ANOVA Models

- One-way analysis of variance tests the equality of population means when categorization is by one variable. The classification variable, usually has three or more levels (one-way ANOVA with two levels is equivalent to a t-test), where the level represents the treatment applied. For example, if we conduct an experiment where we measure durability of a product made by one of three methods, these methods constitute the levels. The one-way procedure also enables us to examine differences among means using multiple comparisons.

- Two-way analysis of variance accomplishes an analysis of variance for testing the equality of population's means when classification of treatments is by two variables. In two-way ANOVA, the data must be balanced (all cells must have the same number of observations) and factors must be fixed. If it is required to specify certain factors to be random, use Balanced ANOVA if data are balanced, General Linear Models are used and if data are unbalanced or if it is required to compare means using multiple comparisons.

Following steps are involved to test NAOVA

Step 1

H0: All sample means are equal

H1: At least one mean is different

Step 2

Find critical value from F table. Tables are for one-tailed test. ANOVA is always one tailed.

Step 3

Compute test value from SPSS test statistics which uses the formula

F = SB2/SW2

Step 4

Make decision. If $F_{CAL} > F_{Critical}$ value(Table Value) reject Hypothesis**.**

Step 5 : Summarize the results with ANOVA table as shown in **Table 5.19**

Table 5.19 ANOVA Summary Table

Source	Sums of square	df	Mean	F	P
Squares					
Between	SS_B	$k-1$	$SS_B/(k-1) = S^2_B$	S_B^2/S_W^2	
Within	SS_w (Also called error term)	$(N-k)$	$SS_w/N-k = S_W^2$		
Total	$SS_B + SSw$		$k-1 + (N-k) = N-1$		

Step 6

Post Hoc Test

If a significant difference is observed, perform post hoc testing to determine which mean(s) is/are different. It demonstrates that which groups differ from the rest. Using SPSS Post Hoc test can be applied. It is applied in different groups, pair-wise. For

example there are three groups A, B and C, then "t" test will be applied three times between groups A and B, groups B and C, groups A and C. The Post Hoc test is mainly applied for following purposes:

- It is Used to determine which mean or group of means is/are significantly different from the others.
- Many different choices depending upon research design and research question (Bonferroni, Duncan's, Scheffé's, Tukey's HSD,)
- It is applied only when ANOVA yields a significant F result.
- The point to be noted is that "p" value applied is determined through number of pairs. For example for a group of three, significance level (alpha – which is .05 in our case) is divided by three. In case of four pairs alpha (.05) is divided by six.

Testing of Hypothesis H_{05}

This hypothesis will examine **Network quality or Quality of service.** Quality of Service (QoS) in cellular networks is defined as the capability of the cellular service providers to provide a satisfactory service which includes voice quality, signal strength, low call blocking and dropping likelihood, high data rates for multimedia and data applications etc. Quality specially pays when it comes to a mobile operator's network. An operator with a reputation for delivering a good-quality network will attract and hold customers. Network quality provides a true competitive differentiator. The challenge is that "quality" does not come quickly or simply. There are several steps, a mobile service providers needs to go through to improve network quality. Those steps start at the planning stage,

continue with evaluation of present performance and include changes for both short- and long-term enhancement of the network.

Based on above discussions the hypothesis was stated as below:

H_{05} There is no difference in Network Quality being provided by Mobile Telecommunication service providers in India.

This hypothesis was firstly tested for whole west central Indian region. There were three groups from where samples are collected. The detail is given below in **Table 5.20:**

Table 5.20 : Distribution of Samples State-wise

Group	Total number of cumulative of samples
Madhya Pradesh	360
Rajasthan	360
Gujarat	360
Total	1080

As explained earlier, there were six questions to judge this construct in questionnaire. A respondent had to answer on five point Likert scale. First the average of all the six questions was calculated for all the three groups (States). Now on these average scores, ANOVA test was applied and results are shown in **Table 5.21**

Table 5.21: ANOVA Summary (Single Factor) Network Quality of Mobile Service Providers in West Central Indian Region.

SUMMARY ANOVA: Single Factor				
Groups	**Count**	**Sum**	**Average**	**Variance**
MP	360	1140.17	3.17	0.3
RJ	360	1069.33	2.97	0.37
GJ	360	1185.33	3.29	0.23

ANOVA						
Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	18.993879	2	9.4969393	31.852239	3.634E-14	3.0040805
Within Groups	321.11412	1077	0.2981561			
Total	340.108	1079				

An analysis of variance evident with the **Table No. 5.21** showed that there was significant difference in network quality of mobile service providers in West Central Indian region with $F(2,1077) = 31.85$, $p=0.000$.

Therefore hypothesis was rejected and it was concluded that there is significant difference in network quality of mobile service providers in West Central Indian region.

As the difference was significant, it was decided to apply **Post-hoc** test using SPSS.

Post-Hoc tests are designed for situations in which the researcher has already obtained a significant omnibus F-test with a factor that consists of three or more means and additional exploration of the differences among means is needed to provide specific information on which means are significantly different from each other discussed in Section 5.7 of this chapter.

The results of Post-hoc applied on three states are displayed in **Table 5.22**

Table 5.22 Post-hoc Summary Network Quality of Mobile Service Providers in West Central Indian Region

Parameter	Group-1		Group-2		Group-3	
	MP	**RJ**	**MP**	**GJ**	**RJ**	**GJ**
Mean	3.166	2.968	3.166	3.291	2.968	3.291
Variance	0.297	0.365	0.297	0.232	0.365	0.232
Observations	360	360	360	360	360	360
Pooled Variance	0.33097101		0.2642928		0.298244226	
Hypoth. Mean Diff.	0		0		0	
df	716		716		716	
t Stat	4.5949		-3.2546		-7.9042	
P(T<=t) one-tail	0.0000		0.0006		0.0000	
t Critical one-tail	1.64698		1.64698		1.64698	
P(T<=t) two-tail	0.00001		0.001189		0.000000	
t Critical two-tail	1.96328268		1.9632827		1.963282684	

There was a statistically significant difference between groups as determined by one-way ANOVA F(2,1077) = 31.85, p=0.000. A Bonferroni post-hoc test revealed that Network Quality was statistically significantly in all the three states as the p value is < .0167 in all the three groups (p value .05/3= 0.167).

To further test this hypothesis state wise, first, Madhya Pradesh state was selected. Initially all the four groups (i.e. four operators in MP) were examined. Thereafter, the test was applied on samples of customers of Rajasthan and Gujarat on similar pattern.

Madhya Pradesh State: Before conducting the test, let us have a look that how the samples are distributed. The summary of statistics for MP state is shown in **Table 5.23**

All the Five of the constructs have means that are more than half of the scale of the centre of scales. The sample standard deviation of Customer loyalty (0.82) is relatively higher, while the others range from 0.33 to 0.54. All the constructs are negatively skewed; the non-normality could be a sign of inter-correlations.

Table 5.23: Summary of Statistics of Sample Data of Madhya Pradesh State

Parameters	PNQ	PV	CC	CL	O_All
Mean	3.17	3.17	3.25	3.22	3.19
Standard Error	0.03	0.02	0.03	0.04	0.02
Median	3.17	3.18	3.29	3.00	3.19
Mode	3.17	3.09	3.29	3.00	3.08
Standard Deviation	0.54	0.45	0.52	0.82	0.33
Sample Variance	0.30	0.20	0.27	0.67	0.11
Kurtosis	0.07	-0.39	0.10	-0.18	0.05
Skewness	-0.16	-0.06	-0.40	-0.30	-0.08
Range	3.17	2.27	3.00	4.00	1.92
Minimum	1.50	2.00	1.57	1.00	2.19
Maximum	4.67	4.27	4.57	5.00	4.12
Sum	1140.17	1141.18	1169.57	1160.00	1150.04
Count	360	360	360	360	360

Comparison of Overall Customer Satisfaction within operators of MP:

In Madhya Pradesh, four operators under study were: BSNL, Airtel, Vodafone and Idea. 90 samples were collected from customers of each operator. Thus total 360 samples were collected by researcher. The hypothesis for MP was stated as below:

H_{05a} There is no difference in Network Quality being provided by Mobile Telecommunication service providers in Madhya Pradesh.

There were six questions to judge this construct in questionnaire. A respondent had to answer on five point Likert scale. First the average of all the six questions was calculated for all the four groups. Now on these average scores, ANOVA test was applied and results are shown in **Table 5.24**

Table 5.24: ANOVA Table: Network Quality Data of Madhya Pradesh State

Groups	Count	Sum	Average	Variance
AIRTEL	90	288.667	3.207	0.216
BSNL	90	253.833	2.820	0.262
IDEA	90	303.667	3.374	0.310
VODAFONE	90	294.000	3.267	0.233

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	15.71	3.000	5.238	20.521	0.000	2.630
Within Groups	90.87	356.000	0.255			
Total	106.583	359				

An analysis of variance evident with the **Table No. 5.23** showed that there was significant difference in network quality of mobile service providers in Madhya Pradesh with $F(3,356) = 20.52$, $p=0.000$.

Therefore hypothesis is rejected and we can conclude that there is significant difference in network quality of mobile service providers in Madhya Pradesh.

As the difference was significant, it was decided to apply **Post-hoc** test using SPSS. The detailed statistics has been shown in **Table 5.25**

Table 5.25 Post-Hoc Test Summary: Network Quality of Mobile Service Providers in Madhya Pradesh

SN	Parameter	Group-1		Group-2		Group-3		Group-4		Group-5		Group-6	
		AIRTEL	BSNL	AIRTEL	IDEA	AIRTEL	Voda	BSNL	IDEA	BSNL	Voda	IDEA	Voda
1	Mean	3.207	2.82	3.207	3.37	3.207	3.27	2.82	3.37	2.82	3.27	3.374	3.27
2	Variance	0.216	0.262	0.216	0.31	0.216	0.23	0.262	0.31	0.262	0.23	0.31	0.23
3	Observations	90	90	90	90	90	90	90	90	90	90	90	90
4	Pooled Variance	0.2389		0.2633		0.2244		0.286		0.247		0.272	
5	Hypoth.M.Diff.	0		0		0		0		0		0	
6	df	178		178		178		178		178		178	
7	t Stat	5.312		-2.179		-0.839		-6.945		-6.022		1.383	
8	P(T<=t) one-tail	0		0.015		0.201		0		0		0.084	
9	t Critical one-tail	1.653		1.653		1.653		1.653		1.653		1.653	
10	P(T<=t) two-tail	0.000		0.031		0.403		0.000		0.000		0.169	
11	t Critical two-tail	1.973		1.973		1.973		1.973		1.973		1.973	

The significance level (α) set in this research is 0.05. For applying Post-hoc test, the significance level set to ⟶ 0.05/6 = 0.008, as six different groups were there. To determine which group differs significantly, the **P value** in above table at Sl.No.10 was compared to 0.08. It is clear from above table that Group-1 ,4 and 5 are having P value <0.008. Therefore it can be concluded that there is significant difference in Network Quality of BSNL and Airtel, BSNL and Idea as well as BSNL and Vodafone. In other groups no difference was observed.

Rajasthan State: The summary of statistics for Rajasthan state is shown in following **Table 5.26.**

Table 5.26: Summary of Statistics of Sample Data of Rajasthan State

Parameter	PNQ	PV	CC	CL	O_All
Mean	2.97	3.05	3.16	2.96	3.05
Standard Error	0.03	0.03	0.03	0.04	0.02
Median	3.00	3.00	3.14	3.00	3.04
Mode	3.33	3.18	3.43	3.00	3.27
Standard Dev.	0.60	0.48	0.51	0.80	0.35
Sample Variance	0.37	0.23	0.26	0.65	0.12
Kurtosis	0.28	-0.39	0.56	-0.12	-0.42
Skewness	0.05	0.08	-0.52	-0.17	0.15
Range	3.50	2.82	3.14	4.00	1.77
Minimum	1.33	1.55	1.29	1.00	2.23
Maximum	4.83	4.36	4.43	5.00	4.00
Sum	1069.33	1098.45	1136.71	1066.50	1099.58
Count	360.00	360.00	360.00	360.00	360.00

In this case also all the five of the constructs have means that are more than half of the scale of the centre of scales. The sample standard deviations of Customer loyalty (0.80) is relatively higher, while the others range from 0.35 to 0.60. Three of the constructs are negatively skewed; the non-normality could be a sign of inter-correlations.

The hypothesis for Rajasthan state was stated is below:

H_{05b} There is no difference in Network Quality being provided by Mobile Telecommunication service providers in Rajasthan.

Similarly the ANOVA test was applied on customers of Rajasthan State and the results of this test are given in following **Table: 5.27**

Table 5.27: ANOVA Table: Network Quality Data of Rajasthan State

Groups	Count	Sum	Average	Variance
AIRTEL	90	282.67	3.14	0.43
BSNL	90	255.33	2.84	0.30
IDEA	90	267.33	2.97	0.36
VODAFONE	90	264.00	2.93	0.33

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	4.336	3.000	1.445	4.058	0.007	2.630
Within Groups	126.793	356.000	0.356			
Total	131.128	359.000				

An analysis of variance evident with the **Table No. 5.27** showed that there is significant difference in network quality of mobile service providers in Rajasthan with $F(3,356) = 4.05$, $p=0.007$.

Therefore hypothesis is rejected and it was concluded that there is significant difference in network quality of mobile service providers in Rajasthan.

As the difference was significant, it was again decided to apply **Post-hoc** test using SPSS. The detailed statistics has been shown in **Table 5.28**

Table 5.28 Post-hoc Test Summary: Network Quality of Mobile Service Providers in Rajasthan

Parameter	Group-1		Group-2		Group-3		Group-4		Group-5		Group-6	
	AIRTEL	BSNL	AIRTEL	IDEA	AIRTEL	Voda	BSNL	IDEA	BSNL	Voda	IDEA	Voda
Mean	3.14	2.84	3.14	2.97	3.14	2.93	2.84	2.97	2.84	2.93	2.97	2.93
Variance	0.43	0.30	0.43	0.36	0.43	0.33	0.30	0.36	0.30	0.33	0.36	0.33
Observations	90	90	90	90	90	90	90	90	90	90	90	90
Pooled Variance	0.365		0.397		0.383		0.330		0.315		0.347	
Hypoth.M. Diff.	0		0		0		0		0		0	
df	178		178		178		178		178		178	
t Stat	3.37012		1.81422		2.24948		-1.557		-1.1501		0.42185	
P(T<=t) one-tail	0.00046		0.03566		0.01285		0.06056		0.12582		0.33682	
t Critical one-tail	1.65346		1.65346		1.65346		1.65346		1.65346		1.65346	
P(T<=t) two-tail	0.00092		0.07133		0.02571		0.12111		0.25165		0.67364	
t Critical two-tail	1.97338		1.97338		1.97338		1.97338		1.97338		1.97338	

Here also significance level set to ⟶ 0.05/6 = 0.008 as six different groups were there. To determine which group differs significantly, the **P value** in above table at Sl.No.10 was compared to 0.008. It is clear from above table that only Group-1 is having P value < 0.008. Therefore it was concluded that there is significant difference in Network Quality of BSNL and Airtel and other groups do not have any difference in Rajasthan state

Gujarat State: The summary of statistics for Gujarat state is represented in below **Table 5.29**

Table 5.29: Summary of Statistics of Sample Data of Gujarat State

Parameter	PNQ	PV	CC	CL	O_All
Mean	3.29	3.27	3.41	3.35	3.32
Standard Error	0.03	0.02	0.03	0.04	0.02
Median	3.33	3.27	3.43	3.50	3.31
Mode	3.17	3.36	3.43	3.00	3.27
Standard Dev.	0.48	0.43	0.54	0.76	0.33
Sample Variance	0.23	0.18	0.29	0.58	0.11
Kurtosis	0.11	-0.70	17.33	-0.15	0.00
Skewness	0.01	0.08	2.24	-0.44	0.34
Range	3.00	2.00	5.43	4.00	1.92
Minimum	1.67	2.27	2.14	1.00	2.50
Maximum	4.67	4.27	7.57	5.00	4.42
Sum	1185.33	1177.09	1227.86	1205.00	1194.81
Count	360.00	360.00	360.00	360.00	360.00

In the case of Gujarat state, it can be noticed from above summary of statistics that all the five of the constructs have means that are more than 3.27 which is comparatively higher that data of all the other states. It shows that customers of Gujarat state are more satisfied with telecommunication services with comparison to customers of Rajasthan and Madhya Pradesh states. Telecommunication service providers are also proving better services in Gujarat. In this case also the sample standard deviation of Customer loyalty (0.76) is relatively higher, while the others range from 0.33 to 0.54. Here we can also conclude that standard deviation of PNQ,PV and CC are relatively at lower side with comparison to Rajasthan and Madhya Pradesh State which is a indicator of homogeneousness of services being delivered by service providers under study. Four of the constructs are marginally negatively skewed; the non-normality could be a sign of inter-correlations. The hypothesis for **Gujarat** state is stated as below:

H_{05c} There is no difference in Network Quality being provided by Mobile Telecommunication service providers in Gujarat

Table 5.30: ANOVA Table: Network Quality Data of Gujarat State

Groups	Count	Sum	Average	Variance
AIRTEL	90	301.8	3.4	0.2
BSNL	90	267.3	3.0	0.2
IDEA	90	297.3	3.3	0.2
VODAFONE	90	318.8	3.5	0.2

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	15.317	3.000	5.106	26.695	0.000	2.630
Within Groups	68.086	356.000	0.191			
Total	83.40247	359				

An analysis of variance evident with the **Table No. 5.30** showed that there is significant difference in network quality of mobile service providers in Gujarat with $F(3,356) = 26.69$, $p=0.000$.

Therefore hypothesis was "**rejected"** and it was conclude that there is significant difference in network quality of mobile service providers in Gujarat.

As the difference was significant, it was again decided to apply **Post-hoc** test using SPSS. The detailed statistics has been shown in **Table 5.31**

Table 5.31 Post-hoc Test Summary: Network Quality of Mobile Service Providers in Gujarat

Parameter	Group-1		Group-2		Group-3		Group-4		Group-5		Group-6	
	AIRTEL	BSNL	AIRTEL	IDEA	AIRTEL	Voda	BSNL	IDEA	BSNL	Voda	IDEA	Voda
Mean	3.354	2.970	3.354	3.304	3.354	3.543	2.970	3.304	2.970	3.543	3.304	3.543
Variance	0.182	0.192	0.182	0.193	0.182	0.198	0.192	0.193	0.192	0.198	0.193	0.198
Observations	90	90	90	90	90	90	90	90	90	90	90	90
Pooled Variance	0.1868		0.1874		0.1899		0.1926		0.1951		0.1957	
Hypo.Mean Diffe	0		0		0		0		0		0	
df	178		178		178		178		178		178	
t Stat	5.9502		0.7748		-2.9078		-5.0949		-8.6902		-3.6222	
P(T<=t) one-tail	0.0000		0.2197		0.0021		0.0000		0.0000		0.0002	
t Critical one-tail	1.6535		1.6535		1.6535		1.6535		1.6535		1.6535	
P(T<=t) two-tail	0.0000		0.4395		0.0041		0.0000		0.0000		0.0004	
t Critical two-tail	1.9734		1.9734		1.9734		1.9734		1.9734		1.9734	

The significance level again set to 0.008 as discussed previously. To determine which group differs significantly, the **P value** in above table at Sl.No.10 was compared to 0.008. It is clear from above table that All the Groups except Group No.2 are having P value < 0.008. Therefore it can be concluded that there is significant difference in Network Quality all the operators except Airtel V/s Idea.

Testing of Hypothesis H_{06} (Perceived Value)

This hypothesis perceived value construct. Perceived value is defined as the result of the personal comparison between perceived overall benefits and the perceived costs paid by the customer (Zeithaml, 1988). Perceived value is the benefits customers receive in relation to whole costs (which include the price paid plus other costs associated with the purchase). In simple terms, value is the difference between perceived benefits and costs. Though, what constitutes value appears to be highly personal, and may vary widely from one customer to another (Holbrook, 1994) (Zeithaml, 1988).Only the customer rather than a service provider can rate a product or service which provided value and the

concept of customer perceived value is perceived to be very subjective and personal (Parasuraman, Zeithaml, & Berry, 1985). In telecommunication terminology PV (Perceived Values) is a facility/return which a customer gets in terms of benefits by recharging his phone by means of various Top-up vouchers (To enhance main balance), Plan vouchers (To select per minute of per second plan), and Special tariff vouchers (To avail reduced tariff for voice calls and various data packs). Based on above discussions the hypothesis was stated as below:

H_{06} There is no difference in Perceived Value (Value for Money) being experienced by customers of Mobile Telecommunication service providers in India.

Just like **H_{05}**, this hypothesis was also tested for whole **West Central Indian** region, which includes three states, four operators in each state and 360 samples from each state.

The **ANOVA test** statics resulted from SPSS has been represented in **Table 5. 32**

Table 5.32: ANOVA Table: Perceived Value Data of West Central Indian Region

Groups	Count	Sum	Average	Variance
MP	360	1141.18	3.17	0.20
RAJ	360	1098.45	3.05	0.23
GUJ	360	1177.09	3.27	0.18

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	8.609963269	2	4.3050	21.0267	0.0000	3.0041
Within Groups	220.5040863	1077	0.20474			
Total	229.1140496	1079				

An analysis of variance evident with the **Table No. 5.32** showed that there is **"significant difference"** in **Perceived Value** of mobile service providers in **West Central Indian** region with $F(2,1077) = 21.02$, $p=0.000$.

Therefore hypothesis was "**rejected"** and it was concluded that there is significant difference in Perceived Value of mobile service providers in West Central Indian region.

This shows that perceived value dimensions are significantly different in West Central India region.

As the difference was significant, **Post-hoc** test was applied using SPSS. The test statistics showed that there was significant difference in Perceived Value while comparing attribute of MP and Rajasthan as well as Rajasthan and Gujarat. However no significant difference was found in perceived value of M.P. V/s Gujarat.

Hypothesis testing for Madhya Pradesh State: Similarly in present case of Madhya Pradesh the hypothesis was stated as below:

H_{06a} There is no difference in Perceived Value (Value for Money) being experienced by customers of Mobile Telecommunication service providers of Madhya Pradesh State.

Table 5.33: ANOVA Table: Perceived Value Data of Madhya Pradesh State

Summary ANOVA: Single Factor (MP)				
Groups	Count	Sum	Average	Variance
Airtel	90	289.72	3.219	0.153
BSNL	90	266.45	2.960	0.191
Idea	90	295	3.277	0.224
Vodafone	90	290	3.222	0.172

ANOVA						
Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	5.4547	3	1.8182	9.8041	0.00000	2.629987
Within Groups	66.023	356	0.1854			
Total	71.47821	359				

An analysis of variance evident with the **Table No. 5.33** showed that there was significant difference in Perceived Value of mobile service providers in Madhya Pradesh State with $F(3,356) = 9.80$, $p=0.000$.

Therefore hypothesis was "**rejected"** and it was concluded that there is significant difference in Perceived Value of mobile service providers in Madhya Pradesh. On further application of **Post-hoc** test it was found that there is significant difference in perceived value attribute while comparing Airtel with BSNL, BSNL with Idea and BSNL with Vodafone. With combination of remaining groups no significance difference was observed.

Hypothesis testing for Rajasthan State: As stated earlier, here also four, same operators were selected with 90 subscribers of each**.** The hypothesis was stated as below:

H_{06b} There is no difference in Perceived Value (Value for Money) being experienced by customers of Mobile Telecommunication service providers of Rajasthan State.

Table 5.34: ANOVA Table: Perceived Value Data of Rajasthan State

Summary ANOVA: Single Factor (RJ)				
Groups	Count	Sum	Average	Variance
Airtel	90	289	3.211	0.217
BSNL	90	269.27	2.991	0.196
Idea	90	266.81	2.964	0.259
Vodafone	90	273.3	3.037	0.225

ANOVA						
Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	3.30916	3	1.1030	4.908	0.00235	2.6299
Within Groups	80.00101	356	0.2247			
Total	83.31017	359				

An analysis of variance evident with the **Table No. 5.34** showed that there is significant difference in Perceived Value of mobile service providers in Rajasthan State with $F(3,356) = 4.90$, $p=0.002$.

Therefore hypothesis was "**rejected"** and it was conclude that there is significant difference in Perceived Value of mobile service providers in Rajasthan. On further application of **Post-hoc test,** it was found that there is significant difference in perceived value attribute while comparing Airtel with BSNL. With combination of remaining groups no significance difference was observed.

Hypothesis testing for Gujarat state: As the hypothesis stated for Rajasthan, in similar way the hypothesis was stated for Gujarat also:

H_{06c} There is no difference in Perceived Value (Value for Money) being experienced by customers of Mobile Telecommunication service providers of Gujarat state.

Table 5.35: ANOVA Table: Perceived Value Data of Gujarat State

Summary ANOVA: Single Factor (GJ)				
Groups	**Count**	**Sum**	**Average**	**Variance**
Airtel	90	296.54	3.294	0.191
BSNL	90	280.09	3.112	0.156
Idea	90	294	3.266	0.177
Vodafone	90	296.63	3.295	0.190

ANOVA						
Source of Variation	**SS**	**df**	**MS**	**F**	**P-value**	**Fcrit**
Between Groups	2.087	3	0.695	3.8884	0.009332	2.6299
Within Groups	63.69	356	0.178			
Total	65.78	359				

An analysis of variance evident with the **Table No. 5.35** showed that there was significant difference in Perceived Value of mobile service providers in Gujarat State with $F(3,356) = 3.88$, $p=0.004$.

Therefore hypothesis was "**rejected"** and it was conclude that there is significant difference in Perceived Value of mobile service providers in Gujarat. On further application of **Post-hoc test,** it was found that there is significant difference in perceived

value attribute while comparing BSNL with Vodafone. In other combination of remaining groups no significance difference was observed.

Testing of Hypothesis H_{07}

In today's digital world, the rules of customer engagement are changing. To continue to acquire and retain customers, organizations need to recognize it and adapt to these new dynamics. The battleground for customers has never been so competitive and complex. Three disruptive forces are combining to create a new contest which will result in fresh winners and losers:

- The rapid adoption of new technology
- Changes in customer behavior/beliefs
- Increasing competition in the industry

Together, these three market forces are applying intense pressures on almost all industries. The digital disruption signals the need for a fresh customer service strategy. Service teams are being called upon to fulfil a greater purpose in the battle for customers. In light of above facts this hypothesis was developed for testing Customer Care Services. When a customer approaches call centre through a toll free number or IVRS(Interactive voice response System) different kind of services offered by all the operators to facilitate their customer to inform them various schemes, tariffs plans, MNP etc.

H_{07} There is no difference in Customer Care Services being experienced by customers of Mobile Telecommunication service providers in India.

As done previously, this hypothesis was again tested for whole west central Indian region first which includes three states, four operators in each state and 360 samples from each state.

The ANOVA test statics resulted from SPSS has been represented in **Table 5. 36**

Table 5.36: ANOVA Table: Customer Care Data of West Central India Region

Groups	Count	Sum	Average	Variance
MP	360	1169.57	3.248	0.2684
RAJ	360	1136.71	3.157	0.2613
GUJ	360	1227.85	3.4107	0.291

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	11.84	2.00	5.92	21.62	0.000	3.00
Within Groups	294.77	1077.00	0.27			
Total	306.60	1079.00				

An analysis of variance evident with the **Table No. 5.36** showed that there is significant difference in **Customer Care Services** of mobile service providers in West Central India with $F(2,1077) = 21.62$, $p=0.00$.

Therefore hypothesis was "**rejected"** and it was concluded that there was significant difference in Perceived Value of mobile service providers in West Central Indian region . On further application of **Post-hoc** test, it was found that there is significant difference in Customer Care Services attribute while comparing, Rajasthan with Gujarat and MP

with Gujarat. No significant difference was found while comparing Rajasthan with Gujarat.

It indicates that **"customer care services"** dimension is significantly different in West Central Indian Region in respect for four operators under study (i.e BSNL, Airtel, Vodafone and Idea). It means that customers of four major telecom operators are experiencing different customer care services in these states.

To further test this hypothesis state wise, first data of Madhya Pradesh were analyzed. All the four groups (i.e. four operators in Madhya Pradesh) were examined simultaneously that whether there is significant difference in customer care services of customers of four service providers (i.e. BSNL, Idea, Airtel and Vodafone). Thereafter, the test was applied on samples of customers of Rajasthan and Gujarat on similar pattern.

Hypothesis testing for Madhya Pradesh State: The hypothesis for measuring experience of Customer Care Services was stated as below:

H_{07a} There is no difference in Customer Care Services being experienced by customers of Mobile Telecommunication service providers in Madhya Pradesh State.

The test statistics is represented in following **Table 5.37**

Table 5.37: ANOVA Table: Customer Care Services Data of Madhya Pradesh State

Groups	Count	Sum	Average	Variance
Airtel	90	287.43	3.19	0.36
BSNL	90	296.29	3.29	0.23
Idea	90	304.71	3.39	0.26
Vodafone	90	281.14	3.12	0.19

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	3.535317	3	1.178	4.518	0.004	2.630
Within Groups	92.85193	356	0.261			
Total	96.38724	359				

An analysis of variance evident with the **Table No. 5.37** showed that there was significant difference in Perceived Value of mobile service providers in Madhya Pradesh State with $F(3,356) = 4.51$, $p=0.004$

Therefore hypothesis was "**rejected"** and it was concluded that there is significant difference in Customer Care Services of mobile service providers in **Madhya Pradesh**. On further application of **Post-hoc** test it was found that there is significant difference in Customer Care Services attribute while comparing Idea with Vodafone only. In other combination of remaining groups no significance difference was observed.

Hypothesis testing for Rajasthan State: Similarly the hypothesis for Rajasthan was stated as below:

H_{07b} There is no difference in Customer Care Services being experienced by customers of Mobile Telecommunication service providers in Rajasthan State .

The test statistics is represented in below **Table 5.38**

Table 5.38: ANOVA Table: Customer Care Services Data of Rajasthan State

Groups	Count	Sum	Average	Variance
Airtel	90	275.00	3.06	0.23
BSNL	90	272.86	3.03	0.31
Idea	90	292.71	3.25	0.29
Vodafone	90	296.14	3.29	0.18

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	4.760261	3	1.587	6.343	0.000	2.630
Within Groups	89.06009	356	0.250			
Total	93.82035	359				

An analysis of variance evident with the **Table No. 5.38** showed that there was significant difference in **Customer care services** of mobile service providers in Rajasthan State with $F(3,356) = 6.34$, $p=0.00$

Therefore hypothesis was **"rejected"** and it was concluded that there is significant difference in Customer Care Services of mobile service providers in **Rajasthan**. On further application of Post-hoc test it was found that there is significant difference in **Customer care services** attribute while comparing Airtel with Vodafone, BSNL with Idea and BSNL with Vodafone. In other combination of remaining groups no significance difference was observed.

Hypothesis testing for Gujarat State: Lastly for Gujarat, the hypothesis was stated as following:

H_{07c} There is no difference in Customer Care Services being experienced by customers of Mobile Telecommunication service providers in Gujarat State.

The test statistics is represented in below **Table 5.39**

Table 5.39: ANOVA Table: Customer Care Services Data of Gujarat State

Groups	Count	Sum	Average	Variance
Airtel	90	296.429	3.294	0.178
BSNL	90	312.429	3.471	0.422
Idea	90	297.714	3.308	0.181
Vodafone	90	321.286	3.570	0.340

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	4.794728	3	1.5982	5.7032	0.0008	2.6300
Within Groups	99.76395	356	0.2802			
Total	104.5587	359				

An analysis of variance evident with the **Table No. 5.39** showed that there was significant difference in **Customer care services** of mobile service providers in Gujarat State with $F(3,356) = 5.70$, $p=0.0008$

The hypothesis was "**rejected"** and it was concluded that there is significant difference in Customer Care Services of mobile service providers in **Gujarat**. On further application of **Post-hoc** test it was found that there is significant difference in **Customer care services** attribute while comparing Airtel with Vodafone, Idea with Vodafone. In other combination of remaining groups no significance difference was observed

Testing of Hypothesis of Customer Loyalty:

The main goal of every company is to ensure profitability and one method to get it for a company is to gain and maintain loyal customers. If a company invests resources to build

customer loyalty without concentrating on profitability it may lead to failure in long term. Customer loyalty becomes significant for a company because it helps the company to build up an exit barrier for their customers. A we have studied earlier following are determinants of Customer loyalty:

1. Service Quality
2. Customer Satisfaction
3. Trust
4. Commitment
5. Switching Cost
6. Corporate Image
7. Service Recovery
8. Emotions
9. Communication

The aim of this hypothesis to test whether there is any difference in customer loyalty of customers of customers of various telecom operators. The hypothesis was stated as below:

H_{08} There is no difference in Customer Loyalty among Mobile Telecommunication service providers in West Central India.

This hypothesis was tested for west central Indian region. There are three states under study. As mentioned earlier, 360 samples collected from each state which formed sampling frame of 1080 samples.

The ANOVA test statics resulted from SPSS has been represented in **Table 5. 40** for **West Central India** for customer loyalty attribute.

Table 5.40 ANOVA Table: Customer Loyalty Data of West Central India Region

Groups	Count	Sum	Average	Variance
MP	360	1160	3.222	0.668
RAJ	360	1066.5	2.963	0.646
GUJ	360	1205	3.347	0.584

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	27.73102	2	13.866	21.926	0.000	3.004
Within Groups	681.0632	1077	0.632			
Total	708.7942	1079				

An analysis of variance evident with the **Table No. 5.40** showed that there was significant difference in **Customer Loyalty** of mobile service providers in West Central Indian region with $F(2,1079) = 21.92$, $p=0.00$

It shows that customers of these telecom operators exhibiting significantly different "**Customer Loyalty".** Hence the hypothesis was "**rejected"** and further **Post-hoc** test was applied. It was found that there is significant difference in **Customer Loyalty**

attribute while comparing MP with Rajasthan and Rajasthan with Gujarat. In Gujarat V/s MP no significance difference was observed.

On further analysis within group (i.e. with in state) : following observations were made:

In case of MP State : It was found that there is significant difference in **Customer Loyalty** attribute while comparing Airtel with BSNL, BSNL with Idea and BSNL with Vodafone. In rest of the groups no significance difference was observed.

In case of Rajasthan State : It was found that there is significant difference in **Customer Loyalty** attribute while comparing Airtel with BSNL, Airtel with Idea and Airtel with Vodafone. In rest of the groups no significance difference was observed.

In case of Gujarat State : It was found that there is significant difference in **Customer Loyalty** attribute while comparing BSNL with Vodafone and Idea with Vodafone. In rest of the groups no significance difference was observed.

Testing of Hypothesis H_{09} (Overall Satisfaction)

In mobile telecommunication language the overall customer satisfaction may be defined as:

"The customer's feeling regarding the deliveries with respect to his or her expectations towards a company, product or service and the perceived performance of the company, product or service."

To judge this hypothesis the average of all the five constructs was taken into account. These constructs are:

- **PNQ (Perceived Network Quality)**
- **PV (Perceived Value)**
- **CCS (Customer Care Services**
- **CL (Customer Loyalty**

Various hypotheses on these hypotheses have been already tested individually. To get the extract of all these four constructs an overall satisfaction hypothesis has been stated. To judge this hypothesis, average of all the 27 questions in has been taken into account. .

The hypothesis is stated as below:

H_{09} There is no difference in overall customers Satisfaction being experienced by customers of Telecom Service Providers in India.

Initially this hypothesis was tested for West Central Indian region as we did in earlier cases which included three states (MP, Rajasthan and Gujarat). Total 1080 samples were collected from these states (360 from each state).

Again ANOVA Statistics was applied to test the hypothesis. The results of ANOVA test are displayed in **Table 5.41:**

Table 5.41: ANOVA Table: Overall Satisfaction Data of West Central India Region

Groups	Count	Sum	Average	Variance
MP	360	1123	3.119	0.780
RJ	360	1016	2.822	0.676
GJ	360	1183	3.286	0.728

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	39.75741	2	19.88	27.31	0.00000	3.00
Within Groups	784.0167	1077	0.73			
Total	823.7741	1079				

An analysis of variance evident with the **Table No. 5.41** showed that there is significant difference in **Overall Satisfaction** of mobile service providers in West Central Indian region with $F(2,1079) = 27.31$, $p=0.00$

It indicates that there is significant difference in **"Overall Customer Satisfaction"** among customers of four major telecom operators in West Central Indian region. Hence the hypothesis was "**rejected."**

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Chapter –VI

Summary of Findings, Conclusions and Recommendations

6.1 Summary of the Thesis

The thesis projected a framework for customer satisfaction in mobile telecommunication industry in WCR region. It used the explosive mobile telecommunication industry as a case study. The area selected was West Central Indian region. The study tested the interrelationship of customer satisfaction with service quality attributes, customer care services, perceived value, customer loyalty (word of mouth-WOM) and overall satisfaction.

It also attempted to investigate whether there is any difference in network quality, perceived value, customer care services, customer loyalty and overall satisfaction of customers of four major telecommunication service providers in Rajasthan, Madhya Pradesh and Gujarat states of West Central Indian region. To conduct the study, four major GSM service providers selected in these states were BSNL, Airtel, Idea and Vodafone.

The research work attempted to emphasize the role of customers in showing the strategies and of service design. When a customer lodged a complaint, the real value of business will perhaps decline, because the expected future earning from that customer may go down. It may be questioned that a firm's current sales and profit figures may not be the

most appropriate measure of success of their trade. If customers experience superior quality of service then they are likely to buy services from the service provider and advocate the service to others also. Alternatively, unsatisfied customers may move to other service providers and also based on their experience may also discourage other to use to the service. More significantly, these value transactions (creation or destruction) cannot be captured in basic financial analysis.

On the foundation of research, the parameters that develop the customer satisfaction can be prepared into the following categories:

- Mobile Network Quality
- Perceived Value
- Customer Care services
- Customer Loyalty

The main customer characteristics pertinent to the effectiveness of service quality attributes are the proper outdoor and indoor network coverage, no call drops, voice clarity during conversation, and proper services during roaming and communicated data speed for internet access. The attributes related to perceived value are low voice and data tariff, value for money top-ups, variety of tariff voucher to choose from as per specific individual needs. When it comes about customer care services, everybody wants world class services. Ideally there should be no queue, the problem should be heard patiently and should be disposed within specified pre determined time. The customer care executives should be polite enough and competent of answering the queries of customers.

This research also tried to find the customer loyalty aspect which incorporates word of mouth publicity (WOM).

The thesis discussed whether there exists any relationship among customers of three states of West Central India under study in respect of:

- Network Quality and Customer Satisfaction
- Perceived Value (Value for Money) and Customer Satisfaction
- Customer Care Services & Customer Satisfaction
- Customer Loyalty & Customer Satisfaction

The thesis further discussed whether there exists any difference in:

- Network Quality being provided by Mobile Telecommunication service providers in India. (State-wise then Operator-wise in a state)
- Perceived Value (Value for Money) being experienced by customers of Mobile Telecommunication service providers in India**.** (State-wise then Operator-wise in a state)
- Customer Care Services being experienced by customers of Mobile Telecommunication service providers in India**.** (State-wise then Operator-wise in a state)
- Customer Loyalty among Mobile Telecommunication service providers in India. (State-wise then Operator-wise in a state)
- Overall customers Satisfaction being experienced by customers of Telecom Service Providers in India.

The proposed conceptual study can be easily adopted by a broad range of industries for customer experience management (CEM), customer relationship management (CRM), strategic planning, resource allocation, and decision making processes.

6.2 Major Findings:

From the research work under taken following findings were observed:

6.2.1 General Findings:

1. The Tele density of India as on 31st March,17 was 92% with 1119.5 million subscribers.
2. The Broadband density of India as on 31st March,16 was 18.8 % with 102.49 million subscribers.
3. There are 26 Telecom circles in India with 13 service providers. Which are BSNL, Bharti Airtel, Reliance Telecom, Vodafone Essar ,Tata Indicom, Idea, Aircel, MTNL, Reliance Jio, Quadrant, Tele-ventures , Sistema Shyam, Uninor and Videocon.
4. Delhi License area stood at top with 253% Tele-density while Bihar was at lowest with 60 % only. (As on 31.03.2017)
5. As on 31.03.2017, Bharti Airtel stood at first position with 23.22 % market share while Vodafone, Idea, BSNL and Reliance-Jio were at 2nd ,3rd ,4th and 5th position with relative market share of 17.51 %, 16.35%, 9.63 and 9.09% respectively.
6. The new entrant Reliance-Jio pulled 9.09 % of market share in a record time period of eight months only as on 31.03.2017

7. Presently 40% mobile phones are smart phones.

8. 30 % Subscribers are from urban and 70 % are from rural background.

9. In broadband penetration, Island was ranked first with 96% penetration while India was at 3rd position after China with 35% penetration.

10. The average data speed of South Korea was found highest with 26.7 Mbps while that of India was only 7.5 Mbps.

11. In case of broadband penetration, Maharashtra stood at first position with 27.1 million subscribers and Himachal was at lowest with 2.84 million customers.

12. Contribution of telecom sector revenue to gross domestic product (GDP) was 1.94 % in 2014-15

13. The market share of Vodafone was found highest in Gujarat at 27.40 % (As on 31.03.17)

14. The market share of Idea was found highest in Madhya Pradesh at 33.0 % (As on 31.03.17)

15. The market share of Bharti Airtel was found highest in Rajasthan at 31.00 % (As on 31.03.17)

16. The BSNL was at 4th position in all the three states under study.

17. In the total sample of 1080 respondents 709 were male and 371 were female.

18. 42.3% respondents were in the age group of 16-25 years, 31.94 % were in 26-40 age groups, 18.24 % were in 41-55 age group and 7.50 were above 55 years age group.

19. 26.30 % respondents had us MNP (Mobile Number Portability) option.

20. 52.56% respondents exercised MNP option first time due to poor network quality.

21. 62.34% respondents changed operator again due to poor network quality.

22. On selection criterion of service provider, 34.44% respondents gave preference to good network quality while 32.2 % choose operator due to low internet data tariff.

23. When it was asked about purpose of having mobile connection, 48.06 % replied that they use it for Internet, 27% us it for voice calls only and 24.72% use for both services.

24. In case average monthly expenditure, the expenditure of 39.26 % was in between Rs 100-200, while that of 28.33 % was in the range of Rs. 50-100. 18.15% respondents were paying Rs. 200-500/Month and only 14.26% were expending more that Rs.500/Month. Therefore service operators should focus on first three groups while developing tariff/marketing strategy.

25. 72.59 % respondents told that they are getting information of various promotional plans/tariff changes timely and 27.41 denied from it. Here again operators should plan to reach 100% subscribers bout their latest plans and tariff offerings.

6.2.2 Objective-wise Findings:

This part will discuss the conclusions drawn upon various objectives undertaken in this study. These are summarized as follows:

Objective 1: To Understand the Mobile Telecommunication Market of India

Findings: The journey of Indian telecommunication sector has been discussed and studied in detail in Chapter-1. It covers since telephone services were introduced in

Kolkata in 1881-82 to growth registered up to 31st March, 17 where telecom network has expanded from nil to 1.19 billion connections (both fixed & wireless).

Objective 2: To understand the Service Quality Delivery Models

Findings: The concept of Service quality and various service quality models were discussed in detail in Chapter-3. It included "Oliver's (1993) Satisfaction Service Quality Model", Grönroos Model, SERVQUAL Model developed by Anantharanthan Parasuraman et al. (1985) and SERVPREF Model given by Cronin and Taylor (1992). Further the concept of these models was used in research.

Objective 3 : To understand the Relationship of Customer Satisfaction with each of :

3 (a) Network Quality

3 (b) Perceived Value

3 (c) Customer Care Services

3 (d) Customer Loyalty

3 (a) Discussion regarding Relationship in between Network Quality and Customer Satisfaction:

Every customer who wants to avail mobile services, first search for quality of network being provided by service provider around his locality and work place. The prospective customer seeks help of friends, neighbours, relatives and retailers of various service providers in surrounding areas. To conduct these analysis 1080 samples were collected from the four major operators i.e. BSNL, Airtel, Vodafone and Idea in Rajasthan, Madhya Pradesh and Gujarat states. To extract fruitful information, 360 samples were collected which included 90 samples from each BSNL, Airtel, Vodafone and Idea operators. The result found from the statistical analysis is summarized as below:

Findings of Objective-3 (a) : Network Quality:

Hypothesis: H_{01} There is **no significant** relationship between **Network Quality and Customer Satisfaction** among customers of different Mobile Telecommunication service providers in India

Result: There is <u>significant relationship</u> between *Network Quality* and *Customer Satisfaction* among customers of Mobile Telecommunication service providers in India.

As mentioned above, to test this hypothesis, Spearman's correlation analysis was applied. There were six items in this construct related to **"Network Quality".** The 1080 respondents submitted their opinion regarding network quality on five point Likert Scale through structured questionnaire. In this scale, "1" represented 'strongly disagree' (the most unfavourable response to the statement) and "5" represented 'strongly agree' (the most favourable response to the statement). Further the average of all the six items was calculated of all the 1080 respondents. On application of Spearman's Correlation analysis, SPSS V22 showed value of **"r" = 0.765** which lies in between 0.6 to 0.8. Therefore it was concluded that there is **"Strong Positive"** relationship between **"Network Quality"** and **"Overall Satisfaction".**

3(b) Discussions regarding Relationship in between Perceived Value and Customer Satisfaction:

This hypothesis tested relationship of perceived value with overall satisfaction of customer. The perceived value is nothing but it is facility/returns which a customer gets in terms of benefits by recharging his mobile phone by means of various Top-up

vouchers (To increase main balance), plan vouchers (To select per minute of per second plan etc.), special tariff vouchers (To avail reduced tariff for voice calls and various data packs). Various operators provide offers in different forms. It may be free minutes, free seconds, free data, free usage value, top up of main balance, free or differentiated calling in odd hours, reduced or free calling in CUG, friend and family calling facility and so on. With the help of this hypothesis, researcher tried to establish relationship between perceived value and overall Customer Satisfaction. This test was also conducted on all the 1080 samples collected in west central India region which included Rajasthan, Madhya Pradesh and Gujarat. The result extracted from this study is stated as below:

Findings of Objective-3 (b) : Perceived Value:

Hypothesis: H_{02} There is no significant relationship between **Perceived Value** (Value for Money) and **Customer Satisfaction** among customers of different Mobile Telecommunication service providers in India

Result : There is <u>significant relationship</u> between *Perceived Value* (Value for Money) and *Customer Satisfaction* among customers of Mobile Telecommunication service providers in India.

The test was conducted using Spearman's correlation analysis again and applied on 1080 samples collected across the three states of West Central India.

The calculated value of **"r"** was found **0.843.** It lies in between 0.8 to 1.0. It shows that there is **"Very Strong Positive"** relationship between Perceived Value and Overall satisfaction.

3 (c) Discussion regarding Relationship in between Customer Care services and Customer Satisfaction :

This hypothesis analyzed relationship of customer care services with overall satisfaction of customers. Customer care services are nothing but different kind of services offered by all the operators to facilitate their customer when a customer approaches their call centre through a toll free number or IVRS (Interactive Voice Response System) to get information about various schemes, tariffs plans, MNP etc . Customer also approaches call centres for replacement of SIM (Subscriber Identity Module), duplicate SIMs, to know balance and validity, to get information about deduction in balance due to various reasons, to lodge complaint related to various services, activation of unwanted VAS etc. To test this hypothesis, data collected from all 1080 samples were analyzed using SPSS V22.0 and Spearman's correlation analysis was applied. The researcher reached on following conclusion:

Findings of Objective-3 (c): Customer Care Services:

Hypothesis: H_{03} There is **no significant** relationship **between Customer Care Services & Customer Satisfaction** among customers of different Mobile Telecommunication service providers in India

Result :There is <u>no significant</u> relationship between *Customer Care Services* & *Customer Satisfaction* among customers of Mobile Telecommunication service providers in India.

In this case the correlation factor **"r"** calculated was found 0.38. It shows that there is "Weak" relationship between **Customer Care Services** and **Overall satisfaction**.

3 (d) Discussion Regarding Relationship in between Customer Loyalty and Customer Satisfaction :

This hypothesis tests relationship of customer loyalty with overall satisfaction of customers. Customer loyalty is an intention that customer devote to a brand or a product. Service quality factors influences on customer loyalty. It is "*an intended behaviour caused by the service and operation based loyalty as a repurchase intention and willingness to provide positive word-of-mouth".* Even after some deficiencies in service delivery, customers keep subscribing their existing company. The hypothesis is stated as below:

Result of Objective-3 (d) Customer Loyalty:

Hypothesis: H_{04} There is **no significant** relationship between Customer Loyalty & Customer Satisfaction among customers of different Mobile Telecommunication service providers in India.

Result: There is **significant relationship** between Customer Loyalty & Customer Satisfaction among customers of Mobile Telecommunication service providers in India.

The correlation factor "**r"** thus calculated was found 0.58. It lies in between 0.40-0.60 range. It shows that there is **"Moderate Positive"** relationship between **Customer Loyalty** and **Overall satisfaction.**

Objective 4: To study, Service Quality delivery levels, being delivered by GSM service providers to customers and it's comparisons on four constructs mentioned as below:

4 (a) Network Quality

4 (b) Perceived Value

4 (c) Customer Care Services

4 (d) Customer Loyalty

4 (a) Network Quality: Analysis regarding Homogeneousness of Network Quality being delivered by Service Providers

Quality of Service (Q.o.S.) in cellular networks is defined as the capability of the cellular service providers to provide a satisfactory service which includes voice quality, signal strength, low call blocking and dropping probability, high data rates for multimedia and data applications etc. Quality especially pays when it comes to a mobile operator's network. An operator with a reputation for providing a good-quality network will attract and retain subscribers. Network quality provides a true competitive differentiator. The challenge is that "quality" does not come quickly or easily. There are several steps a mobile operator needs to go through to improve network quality. Those steps start at the planning stage, continue with assessment of current performance, and include changes for both short- and long-term improvement of the network. The importance and the conclusion from overall study are discussed as follows:

Findings of Objective 4 (a)- Network Quality West Central India:

Hypothesis: H_{05} There is **no difference** in Network Quality being provided by different Mobile Telecommunication service providers in India

Result: "There is **significant difference** in Network Quality being provided by Mobile Telecommunication service providers in India."

As explained earlier, there were six questions to judge this construct in questionnaire. A respondent had to answer on five point Likert scale. First the average of all the six

questions was calculated for all the three groups (States). Now on these average scores, ANOVA test was applied and the calculated value of "F" was found 25.04 while table value of "F" ($F_{Critical}$) was 3.00. The calculated value of "F "was higher than the table value of "F". Therefore hypothesis was **"rejected"** and it was concluded that there is significant difference in network quality of mobile service providers in West Central Indian region. Now to determine which group differs, **Post-hoc test** was applied. Post-Hoc tests are designed for situations in which the researcher has already obtained a significant omnibus F-test with a factor that consists of three or more means and additional exploration of the differences among means is needed to provide specific information on which means are significantly different from each other discussed in Section 5.7.

A **Bonferroni Post-hoc** test revealed that Network Quality was statistically significantly different in all the three states as the p value was < .0167 in all the three groups (p value .05/3= 0.167). **The network quality of Gujarat was found best in all the three states**.

To further test this hypothesis state wise, first, Madhya Pradesh state was selected. Initially all the four groups (i.e. four operators in MP) were examined. Thereafter, the test was applied on samples of customers of Rajasthan and Gujarat on similar pattern.

In Madhya Pradesh, Rajasthan and Gujarat, four operators under study were: BSNL, Airtel, Vodafone and Idea in each state. 90 samples were collected from customers of each operator. Thus total 360 samples were collected by researcher in each state. The study results state-wise were observed as below:

Findings of Objective 4 (a) State wise -Network Quality in Rajasthan MP and Gujarat States:

Hypothesis: H_{05a} There is **no difference** in Network Quality being provided by Mobile Telecommunication service providers in Madhya Pradesh.

Result: There is **significant difference** in Network Quality being provided by Mobile Telecommunication service providers in Madhya Pradesh.

Hypothesis: H_{05b} There is **no difference** in Network Quality being provided by Mobile Telecommunication service providers in Rajasthan

Result: There is **significant difference** in Network Quality being provided by Mobile Telecommunication service providers in Rajasthan

Hypothesis: H_{05c} There is **no difference** in Network Quality being provided by Mobile Telecommunication service providers in Gujarat

Result: There is **significant difference** in Network Quality being provided by Mobile Telecommunication service providers in Gujarat

There were six questions to judge this construct in questionnaire. A respondent had to answer on five point Likert scale. First the average of all the six questions was calculated for all the four groups. Now on these average scores, ANOVA test was applied.

The calculated value of F was found 19.86, which was higher than the table value of F (2.62). As ANOVA results were significant, Post-hoc test was applied.

Result of Post-hoc test:

For applying Post-hoc test, the significance level set to ⟶ 0.05/6 = 0.008 (as six different groups were there). To determine which group differs significantly, the **P value** was compared to 0.08. It was concluded that Group-1(Airtel and BSNL), Group-4 (BSNL and Idea) and Group-5(BSNL and Vodafone) were having P value <0.008. Therefore it can be concluded that there is significant difference in Network Quality of these groups. In Other groups no difference was observed. **The best service provider was found Idea in Madhya Pradesh.**

Similarly in Rajasthan Network Quality was found significantly different among operators after analyzing through ANOVA. Therefore Post-hoc test was applied and it was concluded that there is significant difference in Network Quality of BSNL and Airtel only. Other groups do not have any difference. **In Rajasthan the best service provider was found Airtel.**

Again in the case of Gujarat, Network Quality was found significantly different among operators after analyzing through ANOVA. Using post-hoc test it was found that all the groups were having significant difference in Service Quality delivery. **In Gujarat the best service provider was found Vodafone.**

Analysis of Objective 4 (b) -Perceived Value:

Perceived value is defined as the result of the personal comparison between perceived overall benefits and the perceived costs paid by the customer (Zeithaml, 1988). Perceived value is the results or benefits customers receive in relation to total costs (which include the price paid plus other costs associated with the purchase). In simple terms, value is the

difference between perceived benefits and costs. However, what constitutes value appears to be highly personal, and may vary widely from one customer to another (Holbrook, 1994) (Zeithaml, 1988).Only the customer rather than a service provider can a product or service provided value and the concept of customer perceived value is perceived to be very subjective and personal (Parasuraman, Zeithaml, & Berry, 1985). In telecommunication terminology PV (Perceived Values) are facilities/returns which a customer gets in terms of benefits by recharging his phone by means of various Top-up vouchers (To enhance main balance), Plan vouchers (To select per minute of per second plan), and Special tariff vouchers (To avail reduced tariff for voice calls and various data packs).

Findings of Objective 4 (b) - Perceived Value: In Case of West Central India:

Hypothesis: $\mathbf{H_{06}}$ There is **no difference** in Perceived Value (Value for Money) being experienced by customers of different Mobile Telecommunication service providers in India

Result: "There is **significant difference** in Perceived Value (Value for Money) being experienced by customers of Mobile Telecommunication service providers in India."

From the SPSS V 22 outputs, F_{CAL} was found 16.37 which was statistically significant at 5 % level as F_{CRI} was lower than F_{CAL}. This shows that perceived value dimensions are significantly different in **West Central Indian region.** Similar results were found when tested state-wise (Inter operator). Hence Post-hoc test was applied. The results are summarized as under:

Post-hoc Test: In Case of West Central Indian Region

As the difference was significant, **Post-hoc** test was applied using SPSS. The test statistics showed that there was significant difference in Perceived Value while comparing attribute of MP and Rajasthan as well as Rajasthan and Gujarat. However no significant difference was found in perceived value of M.P. V/s Gujarat

Post-hoc Test: In Case of Madhya Pradesh

On application of **Post-hoc** test it was found that there is significant difference in perceived value attribute while comparing Airtel with BSNL, BSNL with Idea and BSNL with Vodafone. With combination of remaining groups no significance difference was observed.

Post-hoc Test: In Case of Rajasthan

It was found that there is significant difference in perceived value attribute while comparing Airtel with BSNL. With combination of remaining groups no significance difference was observed.

Post-hoc Test: In Case of Gujarat

Here it was found that there is significant difference in perceived value attribute while comparing BSNL with Vodafone. In other combination of remaining groups no significance difference was observed.

Analyses of Objective 4 (c) - Customer Care Services

In today's digital world, the rules of customer engagement are changing. To continue acquiring and retaining customers, organizations need to recognize this and adapt to these new dynamics. The battleground for customers has never been so competitive and complicated. Three disruptive forces are combining to create a new contest which will result in fresh winners and losers:

- The rapid adoption of technology
- Changes in customer behavior
- Increasing competition

Together, these three market forces are exerting intense pressures on almost all industries. The digital disruption signals the need for a fresh customer service strategy. Service teams are being called upon to fulfil a greater purpose in the battle for customers. In light of above facts his hypothesis was developed for testing Customer Care Services. When a customer approaches call centre through a toll free number or IVRS(Interactive voice response System) ,different kind of services offered by all the operators to facilitate their customer to inform them various schemes, tariffs plans, MNP etc.

Findings of Objective- Customer Care Services: In Case of West Central India:

Hypothesis: H_{07} There is **no difference** in Customer Care Services being experienced by customers of different Mobile Telecommunication service providers in India

Result : "There is **significant difference** in Customer Care Services being experienced by customers of Mobile Telecommunication service providers in India."

As done previously, this hypothesis was again tested for whole west central Indian region first which includes three states, four operators in each state and 360 samples from each state. In this case statistics showed F_{CAL}=21.40, p=0.00 which was statistically significant at 5 percent level as F_{CRI} (Table value of F 3.00) was lower than F_{CAL}. It indicated that **"Customer Care Services"** dimension is significantly different in West Central Indian Region in respect for four operators under study (i.e BSNL, Airtel, Vodafone and Idea). It means that customers of four major telecom operators are experiencing different customer care services. To further test this hypothesis state wise, first data of Madhya Pradesh was analyzed. All the four groups (i.e. four operators in Madhya Pradesh) were examined simultaneously that whether there is significant difference in customer care services of customers of four service providers (i.e. BSNL, Idea, Airtel and Vodafone). Thereafter, the test was applied on samples of customers of Rajasthan and Gujarat on similar pattern and the same results were noticed. Here also Post-hoc test was applied. The results are as under:

Post-hoc Test: In Case of West Central Indian Region

It was found that there is significant difference in Customer Care Services attribute while comparing **Rajasthan with Gujarat** and **MP with Gujarat**. No significant difference was found while comparing Rajasthan with Gujarat.

Post-hoc Test: In Case of Madhya Pradesh

It was found that there is significant difference in Customer Care Services attribute while comparing **Idea with Vodafone**. In other combination of remaining groups no significance difference was observed.

Post-hoc Test: In Case of Rajasthan

In this case, it was found that there is significant difference in **Customer care services** attribute while comparing **Airtel with Vodafone, BSNL with Idea and BSNL with Vodafone**. In other combination of remaining groups no significance difference was observed.

Post-hoc Test: In Case of Gujarat

Here again , it was found that there is significant difference in **Customer care services** attribute while comparing **Airtel with Vodafone**, **Idea with Vodafone**. In other combination of remaining groups no significance difference was observed

Analysis of Objective-4 (d) - Customer Loyalty:

The main goal of every company is profitability and one method to get it for a company is to gain and maintain loyal customers. If a company invests resources to build customer loyalty without focusing on profitability it may lead to failure in long run. Customer loyalty becomes important for a company because it helps the company to build up an exit barrier for their customers. A we have studied earlier following are determinants of Customer loyalty:

1. Service Quality

2. Customer Satisfaction

3. Trust

4. Commitment

5. Switching Cost

6. Corporate Image

7. Service Recovery

8. Emotions

9. Communication

The aim of this hypothesis to test whether there is any difference in customer loyalty of customers of customers of various telecom operators. The result was found as below:

Findings of Objective-4 (d) - Customer Loyalty in West Central Indian Region

Hypothesis: H_{08} There is **no difference** in Customer Loyalty among different Mobile Telecommunication service providers in India

Result: "There is **significant difference** in Customer Loyalty among Mobile Telecommunication service providers in West Central India."

This hypothesis was tested for west central Indian region. There are three states under study. As mentioned earlier, 360 samples collected from each state which formed sampling frame of 1080 samples.

The test statistics showed F_{CAL}=2.45, p=0.08 was statistically insignificant at 5 percent level as F_{CRI} (Table value of F 3.0) was higher than F_{CAL}. It indicated that there is no difference in "**Customer Loyalty"** dimension is in West Central Indian region among the customers of four major telecom operators. It means that customers of these telecom operators exhibit same "**Customer Loyalty"** Hence the hypothesis was rejected. Similar results were observed when tested state-wise. The post-hoc test was further applied. The results are summarized as under:

Post-hoc Test: In Case of West Central Indian Region

It was found that there is significant difference in **Customer Loyalty** attribute while comparing MP with Rajasthan and Rajasthan with Gujarat. In Gujarat V/s MP no significance difference was observed.

Post-hoc Test: In Case of Madhya Pradesh

It was found that there is significant difference in **Customer Loyalty** attribute while comparing **Airtel with BSNL**, **BSNL with Idea** and **BSNL with Vodafone**. In rest of the groups no significance difference was observed.

Post-hoc Test: In Case of Rajasthan

It was found that there is significant difference in **Customer Loyalty** attribute while comparing Airtel with BSNL, Airtel with Idea and Airtel with Vodafone. In rest of the groups no significance difference was observed

Post-hoc Test: In Case of Gujarat

It was found that there is significant difference in **Customer Loyalty** attribute while comparing **BSNL with Vodafone** and **Idea with Vodafone**. In rest of the groups no significance difference was observed

Objective 5: To Measure and compare the Overall Satisfaction with the help of constructs mentioned in Objective 3

Analysis : In mobile telecommunication language the overall customer satisfaction may be defined as:

"The customer's feeling regarding the deliveries with respect to his or her expectations towards a company, product or service and the perceived performance of the company, product or service."

To judge this hypothesis the average of all the five constructs was taken into account. These constructs are:

- **PNQ (Perceived Network Quality)**
- **PV (Perceived Value)**
- **CCS (Customer Care Services**
- **CL (Customer Loyalty**

Various hypotheses on these hypotheses have been already tested individually. To get the extract of all these four constructs an overall satisfaction hypothesis has been stated. To judge this hypothesis, average of all the 27 questions in has been taken into account. From the study the researcher concluded that :

Findings of Objective-5- Overall Customers Satisfaction Levels in West Central Indian Region

Hypothesis: H_{09} There is **no difference** in overall customers Satisfaction being experienced by customers of different Mobile Telecom Service Providers in India.

Result: "There is **significant difference** in overall customers Satisfaction being experienced by customers of Telecom Service Providers in India."

Initially this hypothesis was tested for West Central Indian region where total 1080 samples were collected from these states (360 from each state). Using ANOVA Statistics it was observed that F_{CAL}=33.51, p=0.00 was statistically significant at 5 percent level

as F_{CRI} (Table value of F 3.0) was lower than F_{CAL}. It expressed that there is significant difference in **"Overall Customer Satisfaction"** among customers of four major telecom operators in West Central Indian region. Hence the hypothesis is rejected.

Objective 6: Proposed Measures to be takes by service operators based on the study.

Findings: The detailed proposed measures have been explained in following Section 6.3 in the form of recommendations.

6.3 Recommendations

In this part, the researcher tried to enlist recommendation revealed from this study to the mobile telecommunication companies and government agencies like Department of Telecommunications, TRAI etc.

With the passage of time, customers have become more challenging and technological developments have enhanced their expectations. Today customers have a number of choices and they don't hesitate in switching services if a company is unable to deliver up to their expectations or is not offering aggressive rates and services as compared to the market. To make sure customer loyalty, telecom companies should pay concentration to the needs of their customers and try hard to fulfil them.

The final target of any telecom company is to get better the its performance and boost its market share. Though, after Indian mobile telecom is in 4G era, the telecom companies have to tackle with the new aggressive situation, and different 4G mobile telecom services are provided to customers. For telecom companies, this study can be used to find out what factors persuade on customer satisfaction and accordingly developing marketing strategy plans. In this study, it was found that perceived value, service quality, and

customer loyalty all affect the customer satisfaction. But research revealed customer care services do not lead to customer satisfaction.

Here are some tips which will improve service experience for customers.

6.3.1 Suggestions for Telecom Service Providers (TSPs):

Following suggestions are proposed for TSPs on various attributes:

(1) Regarding Network Quality Improvements:

(a) Measure and Evaluate Network Service Quality: One of the major reasons customers point out to stay loyal to their Telecom Service Provider is network's performance uniformity. Customers desire a network always available, without service disruption and fast enough. In order to sustain the preference of high-value customers, it's vital to service providers understand what is the customer's feeling when using network services. It is essential to measure the level of network service quality customers experiences and to assure the network is always available and performing at its crest. Anywhere Anytime,. Having a convergent solution for all networks, customers and devices, that provides concurrent understanding of the impact of the network on customers' experience as well as optimizes time to resolve any outage, enable service providers to take actions to maintain customers' loyalty and optimize network assets

(b) Investment Planning Optimization: Optimize deploying investment by mapping and benchmarking of network coverage, service performance and breakdown points.

(c) Gain Mobile Operational Efficiency: It decreases costs and optimize network availability and performance without expensive drive tests.

(d) Associate Customer Loyalty and Network Service Quality: It enhances customer satisfaction by observing problems before they impact costumers.

(e) Key Differentiators : Following actions are proposed service providers

i. widespread service and network performance watchdog;

ii. Only single performance Monitoring method for Fixed, Mobile and Convergent service Networks

iii. Optical Fiber Networks breakdown proof Monitoring features

iv. Speedy deployment of tests and measurements plans

v. Customer service simulation and Quality of Experience watchdog;

(f) Innovate and Build Smarter Networks: Network volume is expanding due to improved positioning and the rollout of 4G globally. Understanding how, when and where customers are using the telecom networks can lead to improved networks that mechanically accustom to high demands on the network. Suitable design could be used to check and examine network traffic data in real-time, thus optimizing routing and QOS while declining outings and enhancing customer satisfaction. These interpretations can also be used to optimize the sub standard network quality, coverage and operations over time.

(g) Improvement in Overall Network Quality: Based on the findings of this study telecom companies should emphasize on the development of quality of services, network coverage, service delivery and customer care services. These factors have the important relationship with customer satisfaction

(2) Suggestions for Improvements in Customer Care Services :

a. Strengthen Customer Service Skills

Initially, it's important to ensure that customer service team has the correct skills for managing customers' needs. Any of CRM software can't balance for shortcomings in this area. Subsequent skills should be looking for in a customer service executive:

- ✓ **Empathy, patience and consistency**: Some customers will be very angry. Others will be full of questions and others will just be talkative. One should know how to handle all of them and offer the same level of service every time.
- ✓ **Adaptability**. Every customer is dissimilar, and some may even seem to change time-to-time. One must be able to handle shocks, sense the customer's temper and adapt accordingly. This also includes a readiness to learn– providing high-quality customer service is a nonstop learning process.
- ✓ **Clear Communication**. Make sure to convey to customers exactly what is needed. Use genuinely positive language, stay joyful no matter what and never end a conversation without confirming the customer is pleased.
- ✓ **Work ethic**. Customers welcome a representative who will observe their problem through to its solution. At the same time, one must have good time management techniques and not spend too much time treating one customer while others are waiting. Be focused on targets to achieve the right balance.
- ✓ **Knowledge.** Finally customers rely on Customer care services for their information of product. Be informed adequate to respond to most investigation/queries and know where to turn if the queries become too exhaustive

or technical to answer. Customers will be grateful for the sincerity and efforts to discover the correct answer.

- ✓ **Thick skin**. The customer's always right? The skill to ingest one's pride and accept fault or negative advice is crucial. Its role of customer care executive to stay the customer's pleasure in mind.

Empowering Employees: It is necessary to take decisions and to allow them to take control of circumstances and assist them deal with the customer better. This also enhances the message and enhances **customer satisfaction** levels

b. Improve Customer Interactions

If staff has the essential skill set, that's a good start. But they still need to narrate to customers. Here are some instructions for making sure customer service is both systematic and well received:

- ✓ Ask executives to try to identify common ground–like shared interests–with the customers they help. Having this point of understanding makes clash easier to defeat by humanizing the relationship, and it endears customers to executives (and ultimately company).
- ✓ Practice dynamic listening so customers feel heard. Clarify and repeat what the customers say to make sure know them. Understand and reflect their feelings by saying things like, "That must have troubled you" or "I can see why you feel hurt."
- ✓ Confess your mistakes, even if we find out them before customers do. This develops trust and restores confidence. It also permits controlling the state of affairs, re-spotting the customer's attention and resolving the issue.

- ✓ Take notes after a problem is solved. Ensure the issue stays fixed and that customers were pleased with the service. Sending a mail, or even a feedback survey is an brilliant way to let the customer know company is still on their side.

c. Enhance Customer Service Strategy

Employees may have the skills and knowledge to interact with customers. But what organizational tactics can be engaged to please customers? Practice hands-on customer service by making customers happy before they come with problems. Here's how:

- ✓ **Get Personal**. Customers want to feel like they have contacted to real people, not bots and FAQs. Offer more than just mechanical email responses, and do not let the telephone prompts or website send them down a rabbit hole. Take full benefit of social media (such as Face book, Twitter and Instagram, Whatsapp etc.) and write responses when customers post on page. Post photos and articles on website. This shows to customers that real people are working on their behalf.
- ✓ **Be Available**. Part of the personal contact is making sure customers can reach Customer Care.
- ✓ **Provide Valid Treatment to Customers**. Consider deputing executives to specific customers so they can build a relationship. Offer VIP treatment for most excellent customers to let them know they are respected. What extraordinary services might customers like? Set up hub groups, interview customers, or conduct a survey to get thoughts.
- ✓ **Create Communities/Groups**. Customers will experience even more esteemed if we treat them as significant members of a community. Operator can bring

different customers together in various ways, including interactive websites, webinars, social media, trade shows and conventions. .

d. Make Sure Representative are Engaged

One can have the most excellent customer service skills and the best training in the world, but if representative are checked out, it won't affect at all. Betterment of employee engagement is a different way to make sure customers have a great experience. Disgruntled employees are unlikely to come forward with their problems, so consider an unidentified suggestion box or an employee engagement survey to see what makes your employees tick.

e. Give The Customers a Way to Provide Feedback

No matter how practical one is, the organization will by no means be able to get in front of each customer issue. To ensure to learn about the good, the bad, and the bad experience, customers have, create an easily reachable method for customers to give advice.

Whether it's an email survey sent directly from CRM tool, a phone survey at the end of a service call, or a form on the "Contact Us" wall of website, developing means for customers to give inputs makes it convenient for learning what needs enhancement. It also helps keep sad customers from expressing their anger on highly visible places like companies social media pages.

f. Be Consistent: Regular service spans across all touch points to make sure rapid resolutions and customer satisfaction. Customers also anticipate steadiness in service across all channels of communication so ensure that all customer data is matched for enhanced customer support.

g. **Do Investment in Main Concern Areas**: Telecom companies must increase their investments in providing a immense customer experience, to improve declining customer loyalty in the days to come.

h. By increasing its single-view customer profile approach, it can be pointed the untimely signs of churn as the brand works to reengage and transform detractors into promoters.

i. **Identify Key Customers and Minimize Risks**: In line to reduce churn rates, service providers can begin to better understand who of their customer's influencers are and what their needs are. Considering who the influencers are within large social networks can provide important information. If one of these influencers switches, it could cause a chain effect. Collective billing analysis, call-drop analysis and emotion analysis of their customers it can give service providers the options to bring down churn rates by knowing what is going to happen. Extrapolative analytics can systematically warn when action is necessary to stop a customer from going to the competitor by offering a custom-made deal just in time.

j. **Judgment Making Inputs**: The study can be applied as a tool for decision-making to enable organizations, and to allow researchers to relate customer satisfaction to organizational profitability.

k. **Promise of Committed Services**: Relying upon the findings of this study regarding service quality construct, service providers should concentrate on the promise of service quality, customer care services and perceived value improvement. These three

proportions of service quality have the significant relationship with customer satisfaction.

l. **Competitive Pricing**: Relied on the conclusions of this research regarding Perceived Value construct, service providers should focus on how to offer good telecom service with a logical price, how to make customer feel worth selecting their company compared with other telecom operators.

6.3.2 Recommendations for Government agencies TRAI/DOT:

(1) Retain New Mobile Broadband Users

Mobile broadband users tend to churn frequently because most of the new users using pre-paid mobile services are either trying out internet for the first time, or are churning from another service. TRAI can proceed with its plan to extend validity of prepaid data packs from 90 days to 365 days to answer this, and can take additional steps to support new broadband internet users. A policy for allowing free data services without going against the main beliefs of net neutrality is a likely approach.

IT industry institution NASSCOM has recommended that TRAI should give full freedom to apps and service providers to choose on how they offer free data. Operators gave a number of mobile plans to TRAI that can support new users, without the need for service providers to offer nil rated schemes. These comprise offering a slower data rate for free, and free minimum subscriptions, where a inadequate amount of data is available for free at first, the consumer has to pay for additional usage.

(2) Improvement in Backhaul Networks

Backhaul networks channels the traffic from mobile and wireless broadband users to the countrywide backbone. Development in optical fiber optic and microwave backhaul

networks will go a long way in offering a better internet broadband service for all. There is a want for regulations to allow for the growth of backhaul networks at a community level, at the city planning stage, and when it comes to construction of buildings. Highways, drains, roads and rail services can comprise ducts for telecom use, in addition to spaces for towers in the planning phase. Presently, only access to fire safety, water and electricity services are assigned, not access to the internet services.

Right of entry to backhaul networks is time consuming and requires a variety of permissions from local bodies, which can be a more smooth procedure. Development projects also often interrupt the fiber cables laid for backhaul networks. Regular digging and bad planning can direct to more cuts and re-attachments than recommended per length of cable. Efficient planning of such projects can go a long way in improving both wired and wireless broadband connectivity.

(3) Use Cable Service Providers

Making digital cable service providers is acting as a channel in increasing broadband dispersion. Service providers have engaged with local cable service providers to use their understanding of the local/urban and rural features to set up telecom network. Local cable service providers can be associated to deliver last mile connectivity, that too with homemade equipment. Though, cable service providers are regulated mostly by the Ministry of Information and Broadcasting, and not by the Department of Telecom (DoT). This is a difference of interest and a lost opportunity as the MIB has little interest in broadband penetration. TRAI is in initial stage when it comes to start broadband over cable services, and of infrastructure division of telecom service providers and internet service providers with cable operators.

(4) Using Digital global Transmission in Rural Areas

Digital global transmission is a important way to provide big rural areas to the internet services. Live video can be provided to numerous screens, data can be sent to various devices from a single location at the same time, and there is capability to broadcast to moving devices. The public data sender can open up UHF bands to be used by business service providers. Diverting regular television content in rural areas from analog transmitters to digital global transmitters will bring in spectrum for other uses.

(5) Encouraging Virtual Network Operators

The administration has just framed guidelines for virtual n/w operators based on recommendations by TRAI. These will have the capability to resell spectrum, with or without value creation, which will enhance the competition and decrease the tariff for the end user. VNOs can give services from more than one operator, and merge these services for the end user. As this is a novel type of service, the Deptt. Telecom. can ensure that virtual n/w operators can operate free of any abrupt steps by the administration that are popular measures taken to "defend customer interest". Potentially, mobile manufacturers can also float virtual n/w operators to offer telecom services directly to customers.

(6) Convergence of telephonic and broadband networks

Voice and data connections can be offered under a mono license to stop duplication of networks. This will permit for Telcos to propose their services as over the top applications, finishing the impasse and competition with such services. TRAI's consultation paper on VOIP (Voice over IP) services discussed the issues of interconnection, charges, allocation of phone numbers and access to emergency services.

Such a meeting will also give a rise to the Business Process Outsourcing sector, which at present has to replicate their efforts to create infrastructure for voice and data services.

(7) Regulate Mobile Towers in Urban Areas

One of the major reasons for call drops and QoS issues is the random treatment given to mobile towers by local bodies. Central and Local bodies have to be approached separately for licensing formalities. There are no normal rates for urban projects such as residential/commercial building complexes, malls or stadiums to pay telecom service providers, which can be legitimately regulated. Emission doubts lead to random note of towers as and when the local populations get agitated.

These actions comprise sealing of towers, physical dismantling, disconnection of electricity supply. Once a tower is dismantled it can take up to 1-2 years for it to be changed. These hurdles can be addressed suitably with the accomplishment of a single national policy for telecom infra in municipal areas, along with policy that allow better use of this infrastructure. In one direction in which the present infrastructure can be used more cost-effectively is to allow for infrastructure sharing between Telecos.

(8) Infrastructure sharing for ISPs

DoT permitted active infrastructure sharing between telecom operators. The same location cannot have so many cell towers operational, which are no less than not aesthetic additions to the environment, even if a banana tree is more emission generating. An imitated fence is created as only a few operators can work in some areas, and this can revolutionize with infrastructure sharing. This will ensures maximum use of available resources. In municipal areas, infrastructure sharing stops TSPs from entering into

agreements with developers, and then installs the infrastructure that is mainly appropriate to only one operator.

Permitting Internet Service Providers to share infrastructure would bring down the expenditure of providing services to new and distant locations, as well as decrease the cost for the last user. This is relevant in areas with low population where services by multiple broadband providers are not possible.

(9) Availability of Spectrum

The DoT can do a lot of work for offering a long term planning to TSPs of which spectrum will be provided when, forward of making these spectrum bands available for use. Providing the spectrum for license before the auction actually happens can make certain a rapid roll out. The administration can offer inventive for the effective use of spectrum for the service providers. The Department of Telecom can decrease the load on the telecom sector by permitting the TSPs to pay for the spectrum with a pay-as-you-earn payment methodology.

(10) To Encourage Telecom Service Providers

To setup mobile towers, the cost of infrastructure leads heavy costs, and there are different ways available by which government can lessen the financial burden on telecom service providers. The government/local body's influence can be minimized, instead of multiple levies and duties being charged. There can be a single point of contact for licenses and clearances which require numerous submissions for various agencies. Govt. can offer subsidies for importing of equipment needed for betterment of broadband infrastructure. The government can ensure to support funding for telecommunication projects, and alternative sources of such funding.

Another probable way to support internet broadband growth is to subsidize the electricity/power made available to telecom service providers. Another step, Department. of Telecom can take is to ensure TRAI is transparent about the terms when imposing new regulations. TRAI newly introduced a term known as Closed Electronics Communications Network, which seems to be a kind of intranet on which nil rated schemes are allowed, On the other hand, it has not responded to industry looking for clarification on the directives. All these actions can bring down tariffs for the customers.

6.4 Research Limitations

Some of the major limitations of this study are mentioned below which the researcher has come across when accomplishing the process to complete this research. From the study of **"Service Quality & Customer Satisfaction in Mobile Telecommunication in India (With Special Reference to West Central India)",** it appeared that there are some limitations discovered in the following:

1. The research area, the data collection only focused on customers in West Central Indian region in three states (i.e. Rajasthan, Gujarat and Madhya Pradesh). It would have the impact on the accurate of study and cannot represent the actual attitude of the whole Indian mobile consumer.
2. Only one district from each state was selected which may further affect the accuracy of results.
3. Only four operators (i.e. BSNL, Idea, Vodafone and Airtel) were considered for this study which may further affect the results.
4. The sampling groups come from various backgrounds, which may cause an effect on the questionnaires. Some respondents understood the questionnaires and some

respondents needed more explanations. All of these may impact on the accuracy of the answer given.

5. Due to complexity of survey size was kept limited to 1080 which is directly related to accuracy of results.
6. Sometimes respondents show hurried behavior and don't answer carefully. Therefore, their answers may distort the results.

6.5 Suggestions for Future Research

The review of literature enabled that there is very limited research in the area of service delivery-customer satisfaction in India particularly in West Central India region. Based on the research, the subsequent propositions have been prepared for future research:

1 This study only focuses on the customers in West Central India and does not include the customers in other part of country. Therefore, the next research for the person who is interested in this issue can focus more on the other parts, such as, Northern India, Southern India, Eastern India etc or whole country. Alternatively in West Central India, some other geographical areas/Districts can be selected for study.

2 This study only focuses on Indian customers. Therefore, the next research for the person who is interested in this issue can focus more on foreigners visiting India. When foreigners travel to India, some might stay for a long time for work or

study, or some may stay for a short time for enjoyment. They will make the ISD calls; so this issue is significance focusing on.

3 This study only focuses on some main variables (Network Quality, Perceived value, Customer Care Services and Customer Loyalty) relating to customer satisfaction. There might be other variables affecting customer satisfaction and behavioral intentions. Therefore, future researcher may examine more on variables relating to customer satisfaction and behavioral intentions in using mobile telecommunications service for deeply understanding.

4 A strong insinuation to identify exciting attributes within mobile telecom service by benchmarking. For example, just Vodafone has added a new feature to its services which enables subscribers to transfer their money by their mobile phone using "M-Paisa" App.

5 The new attribute should be considered by a new metric which can influence other customer attitudinal and behavioral variables.

6. Recently Reliance Jio entered in to the market using 4G technology. It is offering were free voice and data facility till 31st December, 16. This company can also be considered in future researches as it attracted 12 % market share within a very short period.

7. The case studies could have been extended to other segments of industry such as healthcare, manufacturing, airlines, transportation, , hotel, tourism, transportation, metros , amusement etc.

8. A cross cultural examination to recognize the role of culture in customer behavior can considerably benefit service providers particularly within service attributes plan and customization, as most of service providers are multinational.

9. Similar study may be conducted for foreigners who visit India for relatively longer period. They can provide better insight and comparison with their home countries.

10. In this research only four major operators were studied. In further research, remaining operators or all the operators can be considered for study.

11. More samples can be collected from different socio-economic/geographic territories if time and budget permit.

Table-6.1 Summary of Findings (Result of Hypotheses)

SN	Hypotheses	Test Applied	Result	Remarks
1	H_{01} There is no significant relationship between **Network Quality and Customer Satisfaction** among customers of different Mobile Telecommunication service providers in India	**Spearman's Rank Correlation Coefficient**	**"Strong Positive"**	**There is significant relationship between Network Quality and Customer Satisfaction**
2	H_{02} There is no significant relationship between **Perceived Value** (Value for Money) and **Customer Satisfaction** among customers of different Mobile Telecommunication service providers in India.	**Spearman's Rank Correlation Coefficient**	**"Very Strong Positive"**	There is **significant relationship** between **Perceived Value (Value for Money)** and **Customer Satisfaction**
3	H_{03} There is no significant relationship **between Customer Care Services & Customer Satisfaction** among customers of different Mobile Telecommunication service providers in India	**Spearman's Rank Corr. Coefficient**	**"Weak"**	There is **no significant relationship** between **Customer Care Services** & **Customer Satisfaction**
4	H_{04} There is no significant relationship between Customer Loyalty & Customer Satisfaction among customers of different Mobile Telecommunication service providers in India.	**Spearman's Rank Corr. Coefficient**	**"Moderate Positive"**	There is **significant relationship** between **Customer Loyalty** & **Customer Satisfaction among customers**
5	**WCI Region** H_{05} There is no difference in Network Quality being provided by different Mobile Telecommunication service providers in India	**ANOVA** (F-Test) Then Post-Hoc Test	**Rejected**	A Bonferroni post-hoc test revealed that **Network Quality** was **significantly different** in all the three states as the p value is < .0167 in all the three groups (p value .05/3= 0.167).The **Network Quality** was found the **best in Gujarat** . MP and Rajasthan stood at 2nd and 3rd position
6	**Madhya Pradesh State** H_{05a} There is no difference in Network Quality being provided by Mobile Telecommunication service providers in Madhya Pradesh.	**ANOVA** (F-Test) Then Post-Hoc Test	**Rejected**	Therefore it was concluded that there is **significant difference** in **Network Quality** of BSNL and Airtel, BSNL and Idea as well as BSNL and Vodafone. In other groups no difference was observed.
7	**Rajasthan State** H_{05b} There is no difference in Network Quality being provided by Mobile Telecommunication service providers in Rajasthan	**ANOVA** (F-Test) Then Post-Hoc Test	**Rejected**	It was concluded that there is **significant difference** in Network Quality of **BSNL and Airtel only** and other groups do not have any difference in Rajasthan state
8	**Gujarat State** H_{05c} There is no difference in Network Quality being provided by Mobile Telecommunication service providers in Gujarat	**ANOVA** (F-Test) Then Post-Hoc Test	**Rejected**	All the Groups except Group No.2 are having P value < 0.008. Therefore it can be concluded that there is **significant difference** in Network Quality all the operators **except Airtel V/s Idea**
9	**WCI Region** H_{06} There is no difference in Perceived Value (Value for Money) being experienced by customers of different Mobile Telecommunication service providers in India	**ANOVA** (F-Test) Then Post-Hoc Test	**Rejected**	H_{06} There is significant difference in **Perceived Value** (Value for Money) being experienced by customers of different Mobile Telecommunication service providers in India
10	**Rajasthan State** H_{06b} There is no difference in **Perceived Value** (Value for Money) being experienced by customers of Mobile Telecommunication service providers of **Rajasthan State**	**ANOVA** (F-Test) Then Post-Hoc Test	**Rejected**	On further application of **Post-hoc test** it was found that there is **significant difference** in perceived value attribute while comparing **Airtel with BSNL**. With combination of remaining groups no significance difference was observed.

11	**Gujarat state**: H_{06c} There is no difference in Perceived Value (Value for Money) being experienced by customers of Mobile Telecommunication service providers of Gujarat state.	**ANOVA** (F-Test) Then Post-Hoc Test	**Rejected**	On further application of **Post-hoc test** it was found that there is **significant difference** in perceived value attribute while comparing **BSNL with Vodafone**. In other combination of remaining groups no significance difference was observed.
12	H_{07} There is no difference in Customer Care Services being experienced by customers of different Mobile Telecommunication service providers in India	**ANOVA** (F-Test) Then Post-Hoc Test	**Rejected**	On further application of **Post-hoc** test it was found that there is **significant difference** in Customer Care Services attribute while comparing, **Rajasthan with Gujarat** and **MP with Gujarat**
13	**Madhya Pradesh State** H_{07a} There is no difference in Customer Care Services being experienced by customers of Mobile Telecommunication service providers in Madhya Pradesh	**ANOVA** (F-Test) Then Post-Hoc Test	**Rejected**	On further application of **Post-hoc** test it was found that there is **significant difference** in **Customer Care Services** attribute while comparing **Idea with Vodafone only**. In other combination of remaining groups no significance difference was observed.
14	**Rajasthan State** : H_{07b} There is no difference in Customer Care Services being experienced by customers of Mobile Telecommunication service providers in Rajasthan	**ANOVA** (F-Test) Then Post-Hoc Test	**Rejected**	On further application of Post-hoc test it was found that there is **significant difference** in **Customer care services** attribute while comparing **Airtel with Vodafone, BSNL with Idea** and **BSNL with Vodafone.** In other combination of remaining groups no significance difference was observed
15	**Gujarat State** H_{07c} There is no difference in Customer Care Services being experienced by customers of Mobile Telecommunication service providers in Gujarat State	**ANOVA** (F-Test) Then Post-Hoc Test	**Rejected**	On further application of **Post-hoc** test it was found that there is **significant difference** in **Customer care services** attribute while comparing **Airtel with Vodafone**, **Idea with Vodafone**. In other combination of remaining groups no significance difference was observed
16	H_{08} There is no difference in Customer Loyalty among different Mobile Telecommunication service providers in India	**ANOVA** (F-Test) Then Post-Hoc Test	**Rejected**	It was found that there is **significant difference** in **Customer Loyalty** attribute while comparing **MP with Rajasthan** and **Rajasthan with Gujarat**. **In case of MP state** : It was found that there is **significant difference** in **Customer Loyalty** attribute while comparing Airtel with BSNL, BSNL with Idea and BSNL with Vodafone. In rest of the groups no significance difference was observed. **In case of Rajasthan State** : It was found that there is **significant difference** in **Customer Loyalty** attribute while comparing Airtel with BSNL, Airtel with Idea and Airtel with Vodafone. In rest of the groups no significance difference was observed. **In case of Gujarat State** : It was found that there is **significant difference** in **Customer Loyalty** attribute while comparing BSNL with Vodafone and Idea with Vodafone. In rest of the groups no significance difference was observed
17	H_{09} There is no difference in overall customers Satisfaction being experienced by customers of different Mobile Telecom Service Providers in India.	**ANOVA** (F-Test) Then Post-Hoc Test	**Rejected**	

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Questionnaire in English **Appendix-I**

Questionnaire to Judge Customer Satisfaction based upon Network Quality/ Services of Mobile Network					
SN	**Annexure-A**				
1	**Gender**	**Male**		**Female**	
2	**Mobile No.(Optional)**				
3	**Service Provider**	BSNL	Airtel	Idea	Vodafone
4	**State**	Rajasthan	Madhya Pradesh	Gujarat	
5	**Age**	16-25	26-40	41-55	>55
6	**Is this your first service provider?**	Yes		No	
7	**How many operators did you change till date ?**	1	2	3	>3
8	**Reason to change first Mobile operator**	Billing Problem	Network Quality	Call Drop	Poor Customer Care Services
9	**Reason to change Second Mobile operator**	Billing Problem	Network Quality	Call Drop	Poor Customer Care Services
10	**What do you check first while choosing mobile operator**	Network Quality	Low Call Rates	On recommendations of friend	Low Internet Data Tariff
11	**For what purpose you use the mobile most**	For Voice calls	Internet Uses	Both	
12	**Your monthly expenditure is**	50-100	100-200	200-500	> 500
13	**Did you timely information about various schemes/tariff changes/ promotional offers**	Yes		No	

Annexure-B

Questionnaire to Judge Customer Satisfaction Based Upon Network Quality/ Services of Mobile Network

S. No.	Construct	Q. No.	Question	Very Dissatisfied	Dissatisfied	Neither Satisfied nor Dissatisfied	Satisfied	Very satisfied
Likert Scale Rating				**1**	**2**	**3**	**4**	**5**
1	**Network Quality**	**1**	Are you satisfied with Quality of Call clarity when calling and receiving					
		2	Are you satisfied with Quality to keep Call Drops minimum					
		3	Are you satisfied with Quality of Network Coverage (Signal Availability)					
		4	Are you satisfied with Quality of Speed of Internet					
		5	Are you satisfied with Quality of Network quality in roaming					
		6	How you over all rate Network Related satisfaction					
2	**Perceived Value**	**7**	Are you satisfied with top up amount on Recharges (Full or Extra Talk Time)					
		8	Are you satisfied with Variety of Plan Vouchers					
		9	Are you satisfied with Variety of Special Tariff Vouchers					
		10	Are you satisfied with Validity of Plan Vouchers					
		11	Are you satisfied with Validity of Special Tariff Vouchers					
		12	Are you satisfied with Unauthorised Activation of VAS (Value added Services)					
		13	Are you satisfied with accuracy of charges (ie amount deducted with every call/SMS/Data use)					
		14	Are you satisfied with economy of Voice Plan					
		15	Are you satisfied with economy of Voice Data Plan					
		16	Are you satisfied with Variety of CUG Plans					
		17	How will you over all rate Value for money					

S. No.	Construct	Q. No.	Question	Very Dissatisfied	Dissatisfied	Neither Satisfied nor Dissatisfied	Satisfied	Very satisfied
Likert Scale Rating				**1**	**2**	**3**	**4**	**5**
3	**Customer Care**	**18**	Are you satisfied with Customer support and complaint management systems:					
		19	Promptness (ability to get attendant quickly) at call centre through toll free numbers					
		20	Are you satisfied with problem solving Attitude (response of the attendant) at call centre					
		21	Attitude (response of the attendant) at Physical customer care					
		22	Are you satisfied with time taken by CCE to resolve your problem					
		23	Are you satisfied with Competence (ability to provide a solution)					
		24	How you will overall rate your Customer care satisfaction					

S. No.	Construct	Q. No.	Question	Never	No	Can't Say	Yes	Definitely
Likert Scale Rating				1	2	3	4	5
4	**Customer Loyalty**	**25**	The probability that I would use this service provider again					
		26	The likelihood that I would recommend this provider's services to a friend					
5	**Overall Evaluation**	**27**	Overall, How much you are satisfied with Network Quality, Perceived value, Customer Care services and complaint management System of your operator	**Very Dissatisfied**	**Dissatisfied**	**Neither Satisfied nor Dissatisfied**	**Satisfied**	**Very satisfied**