CHAPTER I
INTRODUCTION

1.1 INTRODUCTION TO SERVICE QUALITY
Twenty first century has spread a technological revolutionary wave in India. With upcoming wireless communication technologies people are becoming more & more mobile addict. The booming revolution in Information Technology sector has pushed the India’s telecom market significantly. Since past few years consumers prefer wireless mode of telephone services to wire line services. Mobility has become an integral part of customer’s life. India has shown tremendous growth in past few years in terms of cellular services. As per the survey report conducted by Voice & Data by the end of Feb 2008 the mobile subscribers number has reached to 246.6 mn compared to wire line services, which is only 40 mn. in numbers\(^1\). Invention of Cell phones is a major improvement over the telecommunications technology of the past, and it has now become an essential commodity in today’s busy life. Cell phones have become the necessity in today’s competitive environment to meet the emerging global economy. This research study focuses on the service quality of cellular mobile services in Pune & Pimpri-Chinchwad area.

1.1.1 SERVICE CONCEPT
Service is a patch up activity to fulfill some one’s need in the market. Service is some thing, which can be experienced but cannot be touched or seen. Services offered by service providers cannot be seen & touched, as they are intangible activities.

Some of basic definitions of service as defined by Management Gurus are :
“A service is any activity or benefit that one party can offer to another which is essentially intangible and does not result in the ownership of anything.”

By Kotler, Armstrong, Saunders and Wong\(^2\)

“Services are economic activities that create value and provide benefits for customers at specific times and places as a result of bringing about a desired change in or on behalf of the recipient of the service.”

By Christopher Lovelock\(^2\)

“Services are the production of essentially intangible benefits and experience, either alone or as part of a tangible product through some form of exchange, with the intention of satisfying the needs, wants and desires of the consumers.”

By C. Bhattachargee\(^2\)

The basic difference between service & product is that services are intangible but products are tangible and are required to follow some standardized procedures. Service user can specify about that particular service satisfaction only after availing it for some period of time. Some of the common service areas are: Retailing, Transportation, Cell phones, Education, Health & hospitality Services, BPO and many more.

1.1.2 CUSTOMER EXPECTATION AND PERCEPTION TOWARDS SERVICE

As per the gap model given by Persuraman & Zeithaml there exists a gap between the customer perception & customer expectation\(^3\). This gap is called as the customer gap.
Customer Expectation represents the actual expected service & Customer Perception revels the actual received service.

Customer expectations are the standards against which the perceived services are checked in order to assess the quality of a service. This basically gives what is expected & what is actually received. If any difference exists between the expected service and actually received service then that difference is called as a gap, which needs to be reduced.

![Diagram of Customer Expectation and Customer Perception](image)

Fig. 1.1 The service gap between what customer expects & what customer receives

1.2 BASICS OF MOBILE SERVICES

Mobile means something in motion. When it combines with services then it indicates that availing of the delivered service when in motion. Communication through telephonic media while roaming is referred as mobile or cell phone service(s).
Mobile services are nothing but Radio-communications services between ships, aircraft, road vehicles, or hand-held terminal stations for use while in motion or between such stations and fixed points on land.

Cellular service is a global radio-based service providing two-way communications by dividing the serving area into a regular pattern of sub-areas called as cells. Each has a base station having a low-power transmitter and receiver.

Cellular Mobile service means availing the telecommunication services(s) any time and any where even if the user is not stationary but roaming somewhere. According to some specific communication characteristics the entire transmission range is divided into small areas, which are called as cells. These cells are responsible for transmitting and receiving the radio frequency signal.

1.3 HISTORY OF CELLULAR MOBILE SERVICES

Cellular mobile phone is a wireless telecommunication device comes with inbuilt mobility feature. Mobile communication technology allows mobile users to avail the roaming facility.

Cell phones / mobile phones, are simple hand-held phones with built-in antennas. Sender & receiver transmit their voice, which is converted into sound waves, & then these waves travels through network to base station, from where it goes to respective destination. Base Station is a transmit/ receive unit responsible for controlling the transmission of a small geographical area called as a cell.
In December 1947, Douglas H. Ring and W. Rae Young, Bell Labs engineers, proposed hexagonal cells for mobile phones. The first fully automatic mobile phone system, called MTA (Mobile Telephone...
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system A\(^6\), was developed by Ericsson and was commercially released in Sweden in 1956. One of the first truly successful public commercial mobile phone networks was the ARP (Autoradiopuhelin, or Car Radio Phone in English) network in Finland, launched in 1971. ARP is viewed as a zero generation (0G) cellular network, being slightly above previous proprietary and limited coverage networks. Different Mobile generations are\(^6\):

- **1\(^{st}\) generation** – Analog system
- **2\(^{nd}\) generation** – TDMA (Time Division Multiple Access)
  - CDMA (Code Division Multiple Access)
- **3\(^{rd}\) generation** – GSM 1800 MHz (Global System for Mobile Communications)
- **4\(^{th}\) generation** – UMTS 1900 MHz (Universal Mobile Telephone System)

### 1.3.1 First Generation: 1G

The first commercial cellular telecom was launched by NTT (Nippon Telegraph and Telephone) in Tokyo Japan in 1979. In 1981 the NMT (Nordic Mobile Telephone System) system was launched in Denmark, Finland, Norway and Sweden. This was the first mobile phone technology that allowed international use of the mobile phone or so-called "roaming". The first handheld mobile phone in the US market was the Motorola DynaTAC 8000X.

The introduction of "cellular" phones, based on cellular networks with multiple base stations, started from 1980s. These base stations are
located relatively close to each other, and service automatically "handover" between two cells when a phone moved from one cell to the other. This generation phones were working on analog system.

1.3.2 Second Generation : 2G
In the 1990s, ‘Second Generation’ (2G) mobile phone system was introduced. This generation introduced new communication feature by sending text messages through phone. This service was named as SMS (Short Message Service). The first machine-generated SMS message was sent in the UK in 1991. The first person-to-person SMS text message was sent in Finland in 1993. It also introduced some new additional features like ring tone downloading and game downloading.

1.3.3 Third generation : 3G
The third generation mobile phone system (commonly known as 3G) was launched with the inclusion of standardization process. It was standardized in the International Mobile Telecommunications - 2000 (IMT-2000) standardization processing. This process did not standardize on a technology, but focuses on communication requirements. Based on WCDMA (Wideband Code Division Multiple Access) technology the third generation phone was launched.

Between 2G & 3G an intermediate system was developed, called as 2.5G system. These generation mobile phones include some of the features of 3G, not all and so does not fulfill the promised high data rates or full range of multimedia services.

1.3.4 GSM & CDMA technology
Digital cellular networks are the need of wireless extensions to establish the connection across the globe. For performing the transmission
among the mobile users, it uses the concept of multiple accesses. Multiple access means simultaneous transmission or access from many sources to one. Multiple access transmission can be achieved through:

- **SDMA** – Space Division Multiple Access
- **FDMA** – Frequency Division Multiple Access
- **TDMA** – Time Division Multiple Access
- **CDMA** – Code Division Multiple Access

SDMA, FDMA & TDMA technologies are based on fixed assignment like frequency and time duration. But CDMA is based on different codes to separate different users in code space & so this technology allows multiple users to access the network through the shared medium without any interference.

**GSM** – the Group Special Mobile was founded in 1982 to support the digital transmissions & now popularly known as Global System for Mobile Communications. GSM was primarily used to support the transmission to users in roaming environment. GSM is today’s most successful digital telecommunication system.

### 1.4 GROWTH OF INDIAN TELECOMMUNICATION

Cellular telephony started in India in early 1990's. In 1994 the Indian government had issued licenses for providing cellular mobile services for the metropolitan cities of Delhi, Mumbai, Kolkata & Chennai.

Indian Telecommunication market has grown a lot since its inception. The number of service providers & subscribers has shown significant growth in past few years. The survey shows that India has 65,396,109
CDMA subscriber base and 184,678,957 GSM subscribers by February 2008\textsuperscript{7&8}. (Source: COAI & Voice & Data April 2008)

Chart 1.4.1: Statistics of service providers in India

Several service providers provide various communication services over cellular mobile phones. The subscriber base of cellular mobile services has shown remarkable growth by 2008. Following chart shows that the Indian telecom industry has given from 165 mn. to 233 mn. new wireless connections just between March 2007 & December 2007. As per the article in voice & data the Indian telecom market is targeting to reach upto 500mn mobile customers by 2010\textsuperscript{9}. 

Table 1.4.1: Number of Wireless telephone lines since 2004 to 2007
(Source: Dept. telecommunication statistics\textsuperscript{10})

<table>
<thead>
<tr>
<th>Number of telephones</th>
<th>March 2004</th>
<th>2005</th>
<th>2006</th>
<th>March 2007</th>
<th>Dec. 2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wireless (CDMA &amp; GSM) (in mn.)</td>
<td>35.61</td>
<td>56.95</td>
<td>101.86</td>
<td>165.09</td>
<td>233.63</td>
</tr>
</tbody>
</table>

Chart 1.4.2: Growth of wireless customers in India\textsuperscript{10}

1.5 SERVICE QUALITY CONCEPT & QUALITY PARAMETERS
Service is an intangible thing, which needs to be experienced before assessing it. Any thing can be measured by measuring their respective service attributes & factors. There are certain Service Quality
parameters as defined by the professional bodies in order to measure the service quality of corresponding service sector.

1.5.1 WHAT IS SERVICE QUALITY

Quality is a key requirement in every field. In terms of Industrial growth quality plays an important role & so should be understood and defined properly. Different management Guru’s in different ways defines quality. But the basic concept remains same i.e. “Meeting to the Need of Customer”.

In most generalized way the Quality term can be defined as “The inclusion of all specified features and characteristics as defined for product or service and its ability to satisfy the given needs as per the requirement of user while using it.”

“A predictable degree of uniformity & dependability to low cost and suited to the market” (By Dr. Edward Deming)

“Quality is conformance to requirements.” (Philips Crosby)

“Quality is a degree to which a set of inherent characteristics fulfills the requirements.” [ISO 9000]

Customer wants to avail different services offered to them by service providers. Delivered service will become as the Quality Service if it meets the customer expectations. But customer expectation depends upon the customer perception, which may differ from person to person.
As per Parasuraman, Zeithaml & Berry the service quality\textsuperscript{13} is defined as:

\[
\text{Service Quality} = \text{Perception} - \text{Expectation}
\]

Service quality is nothing but the difference between the service expectation & service actually received by the customer. Customer has certain expectation about the service. If the customer experience the same service as they expect then this difference will be zero and we can say that the service quality is very good. Higher the difference of above equation lower will be the service quality.

The customer perception is influenced by various factors, which may result in change in service quality as well. Various such factors could be like: Age, gender, Occupation, Global competition & Technological changes. The perception of younger generation of service quality could be different from the older one. Similarly a working corporate professional perception could be different from a businessperson or from a housemaid. That is why the perception should be taken into consideration by service providers to meet the customer requirements.

\subsection*{1.5.2 MEASURING THE SERVICE QUALITY}
Measuring could be done Qualitatively or Quantitatively. Any thing can be measured by evaluating the related factors & respective attributes. Considering various related attributes we can monitor the Service quality. Attributes needs to be measured to get the quality. Quality
measurement is concerned with the observed value for some service attributes & then by comparing these values against standards, it is possible to get the quality status of respective product or process.

A number of large companies have introduced the quality metrics for improving the quality management processes. In general by collecting metrics on several attributes and defects, the entire Quality Management Process can be improved because metrics may help to identify the strong & weak attributes. By improving the weak area(s) companies can improve the quality.

A metric is a type of measurement, which relates to a system, process or related documentation. The use of systematic service measurement and careful monitoring of metric definitely can improve the overall service quality.

In terms of cellular mobile services, various service providers who provide cellular services are assessed with respect to the process metrics parameters. Service providers give cellular services like customer care, data transmission, multimedia service, billing service etc. to their customer. They measure the quality of service given by them to customer in terms of service parameters. Various general service parameters are like: reliability, usability, efficiency, portability. Quality Metrics is designed against such parameters. Specific to cellular mobile services the Quality Metrics includes following factors & attributes, which affects the service quality.

Factors & parameters affecting the quality of Cellular Mobile Services are:
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Mobility, Connectivity, call drops,
Portability, customer-care, Billing service,
Messages Services, fare information,
Number of complaints, Activation time,
Voice Quality, faults repairing,
Mean Time to Repair (MTTR), Billing Credibility

The technical savvy public now demands for high quality of product as well as service. As defined in ITU-T (International Telecommunication Union) Recommendation E.800 the Quality of mobile phones can be measured in terms of Quality of Service (QoS) performance parameters and Network Performance parameters. QoS parameter depends upon user perception. And perceptions are always referred against expectations. Expectations are dynamic & changes over time, age, gender.

Service Quality Measurement requires the measuring of respective service quality attributes and factors. The Mobile service quality is measured through cellular service parameters & factors, which are mentioned above.

1.5.3 SERVICE QUALITY & CUSTOMER SATISFACTION

Service Quality and customer satisfaction are two closely related terms. Service quality can be assessed in two ways: 1) Is it meeting to standard? & 2) Is it satisfying the customer?

As defined by Oliver

“Satisfaction is the consumer’s fulfillment response. It is a judgment that a product or service feature, or the product or
service itself, provides a pleasurable level of consumption-related fulfillment.”

Customer satisfaction is related with the type of service quality, if the quality of service provided by the service provider is good then this leads to the higher customer satisfaction. As defined by Parasuraman, Zeithaml & Berry the service quality depends upon customer perception & customer expectation. And so as shown in figure 1.3, for measuring the service quality, it is necessary that the service provider with respect to the customer expectation as well as the customer perception should understand the service quality parameters. This will help in getting the better service quality and hence higher level of customer satisfaction.

Fig. 1.3 : Service Quality, Service Parameters & Customer Satisfaction
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The customer expectation with reference to various service quality parameters differs from person to person. Such change in perception can affect the customer satisfaction.

Quality is defined, as meeting customer needs. Meeting customer needs requires that those needs be understood. VOC “Voice of Customer” is one of the ways for understanding the customers need & so measuring the service quality. **The "voice of the customer" is the term used to describe the stated and unstated customer needs or requirements.**

1.5.4 QUALITY METRICS

Attributes needs to be measured to get the quality. Quality measurement is concerned with calculating some value for related service quality attributes. By comparing these values against standards, it is possible to get the quality status of any process. Quality Metrics are basically defined for improving the quality management processes. Metrics can be defined by collecting the observed values of Quality of Service attributes.

Metrics can be classified in two broad categories: the product metrics & the process Metrics. But as per the basic definition the service quality is associated with the customer satisfaction. And so quality metrics can be classified as: Mean Time to Failure, Mean Time to Repair, Customer Complaints & Customer Satisfaction Metrics. Service Quality Metrics of mobile services can be designed by observing the experienced service on mobile service parameters.

Customer Satisfaction is often measured by customer survey. Through survey the data can be collected on five-point scale against the service
parameters. This gives actual customer experience against those service parameters.

The overall Service Quality Satisfaction of mobile services is usually obtained through various methods of customer surveys. Based on the five-point-scale data, metrics can be constructed like:

1. Percent of completely satisfied customers with respect to all parameters of services.
2. Percent of partially satisfied customers
3. Percent of neutral customers
4. Percent of dissatisfied customers (dissatisfied and completely dissatisfied)
5. Percent of non-satisfied

In addition to forming percentages for various satisfaction or dissatisfaction categories, the weighted index is used to get the Overall Satisfaction Index.

- Completely satisfied = 100%
- Satisfied = 75%
- Neutral = 50%
- Dissatisfied = 25%
- Completely dissatisfied = 0%

Customer Satisfaction ranges from 0% (all customers are completely dissatisfied) to 100% (all customers are completely satisfied). If all customers are partially satisfied (but not completely satisfied), then this satisfaction may have a value of 75%.
1.6 ABOUT TRAI

The Telecommunications Regulatory Authority of India (TRAI), is an independent body established in 1997 by the Government of India to regulate the telecommunications business in India.

“The mission of Telecom Regulatory Authority of India (TRAI) is to ensure that the interests of consumers are protected and at the same time to nurture conditions for growth of telecommunications, broadcasting and cable services in a manner and at a pace which will enable India to play a leading role in the emerging global information society.”

TRAI has suggested many benchmarks for improving the quality of services from service provider perception & even from customer perception. As per TRAI, ‘Quality of Service’ is the main indicator of the performance & it should consider the subscriber’s perception of the Quality of Service (QoS) as well as customer’s perception of the quality of service provided by the service provider.

1.7 NEED OF THE STUDY

The statistical growth of subscribers in India has changed the Indian market on global map. More and more customers are becoming the addict of mobile phones. People prefer to do, convey their business, marketing, & every other sort of communication through the cell phone. But the question comes about the quality. With increase in technological growth, the customer has also become more & more demanding, as far as quality is concerned. Government & Professional bodies have set up some benchmarks for raising the service quality & service satisfaction level. But the question is - does the customer receiving all such quality
services? Do the service provider follows these service quality benchmarks? What could be the service quality parameters? Further as mentioned earlier the service quality is affected by the customer expectation & perception and perception may differ from person to person. To understand the customer expectations from their perception the need is to incorporate the Voice of the customer.

To achieve this goal the researcher has to first find out the different quality of service parameters from customer expectation point of view. Study shows that there exist several service quality parameters. But the question is what are all those service parameters which customer expects to be fulfilled & must be provided by the service provider qualitatively. To improve the service quality, the need arises to understand the major service quality parameters affecting the cellular service satisfaction from customer’s perception.

Here the researcher tends to identify the core customer service parameters & focuses on their impact on customer satisfaction. As per the SERVQUAL model given by Parasuraman, Valerie Zeithaml, and Leonard Berry, there exists gap between the services delivered & services received by the customer, similarly there exists a gap between the actual requirements of customer and what the service provider have understood.

This reflects that the majority of customers expect high quality as far as service is concerned. But this expectation is closely related & associated with customer perception, which changes from person to person. To raise the service satisfaction level & for good service quality telecom regularity of India TRAI has put up several benchmarks. But despite of several amendments in service policies, TRAI is receiving a
number of complaints regarding the poor quality of services offered by the cellular phone service providers.

To understand the customer satisfaction level the need is to measure it through survey. Service level satisfaction is a qualitative term & so can be measured in terms of customer satisfaction Index score. Customer satisfaction indices (CSIs) are nothing but the uniform measures of customer satisfaction level with reference to the quality of services. Different sectors study their respective score for improving the service efficiency & quality.

1.8 WHAT IS THE DILEMMA?

India has shown tremendous growth in new wireless connections in past few years. More & more customers are using cell phones & availing the various services provided by service providers. Cellular Operators Authority of India (COAI) & Telephone Regulatory Authority of India (TRAI) has set up several policies & benchmarks in order to listen the customer complaints & solve them on time. The benchmarks are framed to raise the customer satisfaction level.

But despite of such benchmarks TRAI is receiving lot of complaints from customers regarding poor customer care, excess billing, poor network coverage & several call drops. Service providers are assuring for all such services. The problem is that all service providers are claiming that they are meeting the customer requirements & so are of good quality. But the fact is different. There exists a gap between the service delivered & service received.
Customer satisfaction depends upon customer perception & expectation. The dilemma is that the perception differs from person to person. So the researcher is incorporating the voice of customer to understand the customer need from customer perception.

Therefore the researcher is trying to calculate the actual Customer Satisfaction Index for Pune & Pimpri Chinchwad area after framing the quality metrics using basic quality of service parameters.

1.9 ABSTRACT OF THESIS & CHAPTERISATION

1.9.1 ABSTRACT OF THESIS (SCOPE OF RESEARCH)

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

1.9.2 CHAPTERISATION

The study is classified in five chapters excluding Appendix & References.

1.9.2.1 CHAPTER 1 : INTRODUCTION

This chapter elaborates a brief introduction about the Mobile services & Quality concepts. The chapter also introduces the need of Quality of service, its measurement through different service parameters. TRAI has suggested several benchmarks for improving the quality of services from service provider perception & even from customer perception. The perception
of customer & service provider regarding the service requirement differs from person to person. Satisfaction Index is used by TRAI to understand the service satisfaction level. This chapter introduces the basic service quality concept along with service parameters, which affects the service quality. Further the chapter discusses about the customer perception & customer expectation. This chapter highlights the major gap areas that exist between the service provider & the customer. Various issues & parameters to reduce such gap are discussed in subsequent chapters.

1.9.2.2 CHAPTER 2 : LITERATURE REVIEW
This chapter provides the literature review related to service quality parameters & service satisfaction measurements. The TRAI & COAI annual reports and statistical data are used as the standardized base for evaluating the service quality of mobile services. The existing service quality model & their corresponding impacts on mobile services are covered in this chapter. To study the basics of customer satisfaction index for mobile services the researcher has referred the existing customer satisfaction Indexes like American Customer Satisfaction Index (ACSI), European Customer Satisfaction Index (ECSI). Their detailed reviews with Quality of Service parameters are included in this chapter.

1.9.2.3 CHAPTER 3 : RESEARCH METHODOLOGY
The complete research methodology related to the study is covered in this chapter. Here the sources of primary & secondary data, along with the data gathering techniques are specified. The complete research process right from data
gathering to data analysis & hypothesis testing various phases of research process involved during the study, are covered in this chapter. Questionnaire, interview techniques along with different scaling techniques, which are used to design the questionnaire & to gather the survey data, are explain in this chapter. Quality of a system depends upon several parameters. This study focuses on basic service parameters from customer’s satisfaction point of view. It includes main parameters like Network connectivity, Call drops, Value Added Services, Billing Services & Customer care. The index calculation method & quality metrics designing using these parameters are discussed in chapter 3.

**1.9.2.4 CHAPTER 4 : DATA ANALYSIS**

The fourth chapter focuses on the Data Analysis. The gathered data is processed and is analyzed according to the defined outline. Hypothesis testing is done using the Chi Square testing through SPSS package. The editing, coding, validating the data, categorization of data & tabulation of collected data are the key steps involved in data processing. The detailed analysis of collected data covering all steps is mentioned in this chapter. The survey data is collected through several customers belonging to Pune & Pimpri-Chinchwad area. The data was gathered from different service providers covering Idea, AirTel, BSNL, Reliance & Tata indicom. The chapter also includes the design of quality metrics and calculation of the overall satisfaction index using multiple regression model.
1.9.2.5 CHAPTER 5 : FINDINGS, CONCLUSIONS, SUGGESTIONS & FUTURE DIRECTION

This chapter enlists the research findings, conclusion, suggestions & limitation of the study. It provides a summary of all the findings and results in the form of conclusion. Further relevant suggestions are conveyed in form of solution, which will be useful to government organization to set up the new service benchmark. This chapter explores in brief about the obtained result of the research study. It also highlights the limitation of survey, which is limited to Pune & Pimpri Chinchwad area only.
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