Chapter 1

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Introduction

1.1 Introduction

The name “telecommunication” originated from the Greek word “tele” (Distance) and the Latin word “communicare” (sharing). In the ancient days, communication had a different dimension, like in the form of smoke signal, drums, flags or pigeons. The modern means of communication have now evolved to include wireless communication, under sea cables and geostationary satellites. With the rising popularity of wireless transmission, the speed and data transmission capacity also improved. Researchers of Karlsruhe Institute of Technology, Germany has developed a technique through which 26 terabytes per second of data can be sent (Karlsruhe Institute of Technology, 2011).

Progress of telecommunications has influenced our lives in multiple ways. Telecommunication is now accepted as a catalyst for the development and prosperity of a nation. It was introduced in India by the British during the 19th century. In October 1851 on an experimental basis, electric telegraph lines were installed in Kolkata (Economic Times, 2014). In British times, Dr. William O’Shaughnessy is known to have pioneered the telegraph and telephone in India (Vatsal and Premraj, 2007).

During early 1881, the British company, Oriental Telephone Company started telephone exchanges in Calcutta, Bombay, Madras and Ahmedabad. Telephone service formally started on January 28, 1882 with a total of 93 subscribers (Bharat Sanchar Nigam Limited, 2012).

From the year 1902, technological improvements brought many changes; introduction of the telegraph, radio telephone, trunk dialing, etc. Trunk dialing permitted subscribers use telephone with an operators help and remained popular for quite some time but was eventually replaced by automatic switching technology. During the later period of British era telecom connectivity was established in major cities and ports.

The first cellular call in India was made from Kolkata on August 31, 1995 using Modi Telstra’s GSM network of Kolkata through a Nokia handset by the Late CM of West Bengal Jyoti Basu to telecom minister Sukhram (Dey, 2010). Wireless communication took some time to gain popularity in India. The major reasons were the high tariff, cost of handset and limited network coverage. In India mobile service was created by the government. Both telephone and postal services was previously under the Department of Post and Telegraph. In 1985 the department was split to establish the Department of Telecommunications (DoT) along with Mahanagar Telephone Nigam Limited (MTNL) and Videsh Sanchar Nigam Limited (VSNL). MTNL provided telecommunication only to Delhi and Mumbai. International connectivity was provided by VSNL. VSNL was acquired by Tata Group in
1998 and renamed Tata Communications Ltd (Goveas and Chaudhary, 2012). DoT continued to provide telecommunications operations to the rest of India other than Delhi and Mumbai.

1.2 Liberalization of the Indian telecom sector

India's telecommunication sector underwent a spectacular transformation as a result of liberalization. Initially manufacturing of telecom equipment was deregulated. Later private service providers were allowed to launch wireless text service or paging. The National Telecom Policy 1994 (NTP, 1994) acknowledged that the present infrastructure and other existing government resources may not be enough to bring anticipated growth in the telecom industry. Private investment only can fill the void in the finance and telecom infrastructure. The government expected that growth of telecommunication will have an immediate effect on the GDP, employment and all round economic development. This made way for the formation of the New Telecom Policy 1999 (NTP, 1999). The primary objective of NTP 1999 was to make the industry attractive for private investors and development of adequate telecommunication infrastructure (Department of Telecommunication, 1999). In October 2000 the government separated the operational branch of DoT and created Bharat Sanchar Nigam Limited (BSNL).

1.3 Characteristics of Telecom Industry

The Indian telecom industry has some characteristic features, some are similar to trends elsewhere and some are exclusive to Indian. Major characters are discussed below:

**Entry and Exit Barriers:** Telecom industry is characterized by costly barriers. A Service provider requires huge capital to build or hire the necessary infrastructure for providing services to customers. Because of the high cost of capital involved, in most countries the government owned telecom service organizations enjoyed a monopoly. When a mobile service provider finds it difficult to compete and wants to quit the industry, finding a right buyer is a formidable task. The buyer should be willing to pay the huge amount, enter the market and face the challenge.

**Customers:** When there are many players competing in an open industry, customers benefit from the competition. They can bargain for the best service and the best price in a buyer’s market. They can easily switch from one player to another without having to bear any switching costs. Customers are highly quality conscious and demand supplementary services. They also want the best bargain in terms of the price of the services. If industry players fail to meet any of these demands by customers, they risk losing them to competitors.

**Competition:** The intangible, inseparable and heterogeneous nature of telecom service poses difficulty to new players in attracting potential customers. It also makes it difficult for the existing players to retain their customer base. Therefore, players attempt to convince customers by offering various value added services using advanced technology. To provide quality services, telecom service providers need a robust IT infrastructure. Unless players find reliable suppliers who provide quality equipment and superior technology solutions, they will be unable to offer good service.
Higher acceptance for mobile service: Mobile service is being accepted in a big way in India. During the January-March quarter of 2014, India has overtaken China in net addition of mobile subscribers. India added 28 million new mobile subscribers, while China’s subscriber base increased by 19 million (Business Standard, 2014). Mobile communications are being preferred more than fixed-line telecommunication services. While the mobile subscriber base has increased by 75 per cent, the fixed-line subscriber base has grown negligibly during this period. An increased number of wire-line subscribers are contemplating on surrendering their land line connections because mobile service offer better, cheaper, portable and multi functional features (Kapoor, et al., 2011).

Low Average Revenue per User (ARPU): Although the mobile industry is growing at a phenomenal rate, ARPU is decreasing. ARPU consists of subscriber monthly bill and earnings from incoming calls. As observed from a report in The Hindu Business Line, the voice based APRU for GSM is INR 200 and for CDMA it is approximately INR 90 (The Hindu Business Line, 2009). Good customer service and new value added services in the non-voice category can increase the ARPU for a mobile service provider.

Demand and Supply: Two important character, perishability and intangibility associated with a service product make it impossible to store and utilize it during peak demand periods. Demand for mobile services can vary because of multiple reasons like the economy of a place, demographic variables, natural calamities or special day like 31st December. Mobile telecom service providers should evaluate the reasons behind demand fluctuation so as to create an optimal and efficient service delivery model. For a subscriber, if a network remains busy or the message “all channel busy” is displayed, the overall service experience with the service provider becomes poor. Alternately, excess infrastructure if kept idle is a lost opportunity cost. Demand and supply need to be harmonized by shifting demand to non peak hours or sharing capacity to balance spikes in demand. Some mobile service providers offer attractive night time tariff to shifting daytime demand using differential pricing strategy (Airtel, 2014).

Device convergence: In its earlier form, the mobile phone was only a device for voice talk, devoid of even an alarm clock or calculator. Simply put, it was just a portable communication device meant for the corporate executive. Even a decade ago mobile users were not familiar with the concept of listening to music or watching video on their mobile. Gradually mono-colour handsets were replaced by colour handset with enhanced multimedia features. Mobiles evolved from the bulky set, giving very less battery backup, to sleek touch phones with battery power lasting days. After telecom regulatory authority of India (TRAI) permitted mobile operators to start General Packet Radio Service (GPRS), many value added services like the mobile internet was introduced. Mobile handset manufacturers, service providers and content makers, especially the music companies are converging together, to transform the once humble communication device into a veritable digital jukebox.

Revenue from non-voice value added service: With 35-40% of non-voice profits being earned from music, around Rs 300 Crore in 2013, mobile service providers are beefing up
their network and promotions in response to the growing demand for music content (Business World, 2013). Sa Re Ga Ma has started a service in which songs can be downloaded to a PC in exchange of a nominal amount, which later can be transferred to a mobile. Sound Buzz, a Singapore based content distributor has 90,000 Hindi and regional songs in its online database. Mobile users can listen to sample songs, download the selected ones, and charged later for the purchased music in their monthly mobile bills. The world’s first “mobile premier” of a film was done for ‘Rok Sako to Rok Lo’. It was done one day before the worldwide release of the movie. The movie was streamed live to subscribers of Airtel (with edge enabled handset) and they had to tune in at the scheduled time. Airtel took every possible measure to ensure that the movie cannot be copied or downloaded (The Statesman, 2012). Popular books like Bram Stoker Dracula, Alice in wonderland and many more can be downloaded using the GPRS service and read from a mobile. Mobile books are creating a challenge for traditional publishers. Most publishers in Japan release an eBook version within six month of publishing a printed book (Japan today, 2010). Mobile games are another area which promises mobile service providers additional source of revenue. Games on popular Hindi blockbusters like Sholay and Ghajini have become extremely popular. Sony Pictures and Television will be releasing eight new mobile game based on films and TV series produced by it at the end of this year. Mobile service providers make them available to their customers and thus act as a distributor (Sony Pictures, 2014). Mobile mp3 ringtones have opened up a new opportunity for record albums and artists plagued with diminishing revenues and music piracy. For certain ringtones artists and record label owners are signed up with the objective of generating revenues only from mobile content (Banerjee, 2010). A strong growth has been registered across India for mobile games. Industry experts expect that it will generate revenue of US$ 9.8 billion by the end of 2014 (Buellingen and Woerter 2004). With the availability of more viewer friendly mobiles with wider screens, mobile video services are gaining popularity.

**Rapidly changing government policy:** In India separate licenses have been issued for basic (fixed-line) phone, mobile, data/internet service, and satellite TV operators. The first step towards liberalization took place with the implementation of National Telecom Policy, 1994 (NTP 94). NTP 94 was instrumental in opening the industry to private investors. The policy also emphasized on expanding the rural telecom network. Later in March 1999 a New Telecom Policy (NTP 99) was passed to encourage growth in the sector (Singh, et al., 2002). However, because of frequent addition and modification of telecom policy, the year 2011-2012 was a challenge for the whole industry. Headlines were made when the Supreme Court verdict cancelled 144 licenses. The second verdict on adjusted gross revenue similarly created apprehension in the industry. Certain mobile service operator like Uninor started thinking on viability of the business. With declining profit, high regulatory costs like spectrum prices, cost of implementing security measures and mobile number portability, the mobile service industry is fighting to keep its head up (Mathews, 2012).

**Cheapest tariff structure in the world:** India presently has the lowest mobile tariff globally. But according to independent industry experts and the Cellular Operators Association of India (COAI), tariffs will increase in near future. Already some telecom service providers
have increased their call charges like Reliance Communication and Idea Cellular. COAI is predicting a minimum tariff of 64 paisa per minute for local calls (TOI, 2013). The telecom commission is considering “spectrum re-farming” in 900 MHz, which again raises the possibility of a hike in tariff (Business Standard, 2013). Spectrum re-farming is a process of re-using existing spectrum, where the government intends to take back the entire spectrum in certain bands, and then redistribute it through an auction. In the present situation the government wants to reuse the 900 MHz band. In this band the veteran mobile service provider like Vodafone and Airtel operate. This band is the most efficient of all available spectrum bands, requiring less number of mobile tower and equipment. The Government justifies this move, commenting that this will lead to a more level playing field amongst the operators and will also lead to better utilization of this spectrum band. The Government is initiating this move as the licenses of Airtel and Vodafone who are using this spectrum band, are due for renewal between 2014 and 2016, depending on the circles. Telecom Commission has recommended that the telecom operators can bid in the auction for 900 MHz band that will be held in 2013, or can buy substitute band in the less efficient 1800 MHz spectrum (Jha, 2013).

1.4 Research problem/ Need of the study

Post liberalization of the telecom industry, twenty one different mobile service providers started operating. With the availability of multiple mobile operators, the bargaining powers of subscribers were also greatly increased. Dissatisfied subscribers could effortlessly chose another new service provider by just changing their SIM card or opting for number portability. Traditionally, companies tried to retain customers through incentive based loyalty strategies. These strategies include free or reduced late night call, free data offer etc. But with multiple service operators, all providing the same promotional offers, these strategies become less effective in the long run (Dick and Basu, 2012). Mobile operators are now giving more emphasis on making their service more dependable; being more proactive in addressing to customers grievances and innovating customized service packs. Most service providers now agree that attracting a new subscriber is just the preliminary stage where profit will only come when a subscriber continues with the same service provider for a considerable time. (East et al, 2013).

The present research is conducted to find consumer’s perception and attitude towards these loyalty strategies.

1.5 Brand loyalty and loyalty strategies

Acquisition and retention of subscribers is one of the most vital functions of an organization. It is easier to retain an existing subscriber than acquiring a new one (Saxena, 2010). Retaining old subscribers helps in cross-selling the different value added services thus adding to profitability. To retain a subscriber, firms need to have brand loyal customers. Loyalty can be increased by carefully planned loyalty strategies. A brand is the physical and emotional alliance between a company and its customers - a cluster of messages, shared experiences and relationships. A brand consists of both tangible and intangible elements. This is conceived in
the customer’s mind in the form of attributes. This perception functions as a foundation stone, which leads to repurchasing and later gets settled as brand loyalty (Sengupta, 2005).

In marketing, loyalty is understood as a customer’s promise to persistently buy or use the same product manufactured by the same brand. Customer repurchasing a brand due to situational constraints or unavailability of an alternative and more out of convenience does not define as brand loyal. This group of customer is known as spurious loyal (Moisescu, 2008). True loyalty exists when a customer makes a repurchase without the presence of any constrain, and just because they like the brand. Loyal customers are asset for organizations as they represent an existing subscriber base, will agree to a price hike and have the potential to spread positive word of mouth. Brand loyalty consists of pre-dispositional promise towards a brand. Loyalty behavior is exhibited by customers when they perceive a brand as dependable and matching to their expectation (Reichheld, 2001).

In the context of brand loyalty, Philip Kotler (2014) defines four patterns of behavior:

1. Hard-core Loyal – Customer buying the brand every time.
2. Split or soft-core Loyal - Customer loyalty is divided between more than one brand.
3. Shifting Loyal - Loyalty shifts between brands offering similar products.
4. Switchers – This segment do not show loyalty to any brand. These customers are generally deal seekers or choose a new brand to experience something new.

Theoretically loyalty can be described as an individual’s feelings or attitudes towards a brand, company, shop, etc. that incline a customer to continue to re-purchase the same brand, product, time and again (Wernerfelt, 1991). Lee and Cunningham establishes in their research paper that, perception influences customer’s judgment which in turn creates loyalty (Lee and Cunningham, 2001). Organizations’ thus need to develop and implement strategies which can retain customers by making them loyal (Kim et al., 2004). Research has established the link between improved service quality with increased satisfaction and loyalty (Keaveney and Parthasarathy, 2001). In the Japanese way of life, quality is understood as product having zero defects. Measuring and maintaining quality for tangible products are relatively simple. For an intangible product like service, maintaining uniform quality time and again becomes an extremely difficult task (Cronin and Taylor, 1992). The three basic characters of service, responsible for making it a challenge are intangibility, heterogeneity and inseparability. The intangible character makes it difficult to quantify subscriber’s perception about service quality. The second character, heterogeneity, makes every service experience different.

Production and consumption of service take place simultaneously, making a service inseparable from production. Lemmink, Schuijf, and Streukens have concluded in their research paper that service qualities have two parameters – process and output (Lemmink et at., 2003).

A positive corporate/brand image can increase revenues resulting from enhanced subscriber satisfaction and loyalty to the brand. A firm’s image additionally helps attracting both investors and future employees as well (Andreassen and Lanseng, 1998). In their research paper Nguyen and LeBlanc (Nguyen and LeBlanc, 1998) experimented on the relationship
linking service quality and brand image. The research exhibited that customers who recognize service quality to be better, develop a positive image of the organization. For financial services, price is a vital reason for switching (Roos et al., 2004). Pricing a service low can attract deal seekers, but if substantial number of customers are not acquired, a firm risks becoming bankrupt. A mobile service provider require a constant flow of revenue to meet the constant investment in new technology, maintenance of infrastructure, spectrum fee etc. Study of various literature conveys that service quality, corporate image/positioning, subscribers overall satisfaction and price are important parameters which can reduce subscribers churn.

1.6 Present state of mobile telecom industry

With privatization of the industry, the number of mobile service providers also increased at a rapid pace. To regulate the industry, a separate authority, TRAI was created which started functioning from February 1997. The primary objectives of TRAI include setting quality standards, fixing tariff etc. The mobile telecommunication industry presently have the second largest subscriber base globally with 21 service providers operating in 22 telecom circles and offering the lowest tariff structure in the world (The Telegraph, 2011). The industry accounts for 2% of our nations GDP and generates direct employment to 2.8 million (COAI, 2011).

Government owned telecom service providers like MTNL and BSNL under the department of telecommunication (DoT) dominated the telecom industry in India for several years. It was only in 1994 that the telecom industry was opened to private players. Foreign players were encouraged to invest in India by increasing the amount of equity ownership in Indian telecom companies from 49% to 74% (The Telegraph, 2011). With multiple service providers offering nearly identical services, price wars started and tariffs reduced to such a level that even the common man could think of having a mobile connection, which was earlier the luxury of the rich. The quality and efficiency of service also improved tremendously and phone connections, which earlier took years to be sanctioned during the monopoly of BSNL, began to be issued within days. All this effort resulted in a tremendous increase in subscriber base. The number of mobile subscriber is anticipated to increase to 815 million towards the end of 2014 from 755 million connections in 2013 (NDTV, 2014). Most operators follow GSM mobile system, which operates between the 900 MHz and 1800 MHz bandwidth. CDMA operators operate below the 800 MHz band.

Even though the mobile telecommunication industry is experiencing rapid growth, it is plagued by multiple obstacles like spectrum crunch, frequent policy change, and technology upgradation (India Today Online, 2012). In 2008, 3G service started in India by Government owned MTNL and BSNL. After the auction of 3G wireless spectrum, private operator’s launched 3G services (Hardy, 2012).

To become operational, mobile service providers have to invest huge capital, especially in infrastructure and license fee. Tata Teleservices for instance, have invested Rs. 7,533 Crore in India, for infrastructure (Banerjee, 2011). Because of the high startup cost, in most
countries the government used to invest, and thus monopolize the industry. Post liberalization, with multiple operators offering the same service at similar prices, customers are having greater bargaining power and the option to select the mobile operator of their choice. In a buyer’s market, service providers can be changed by just changing the SIM card or applying for number portability. Retaining and increasing subscriber base is gradually becoming a formidable task for mobile service providers.

1.7 Market Segmentation

The telecom industry is divided into the following segments based on the consumer-

- Individual: This is the largest and most important segment in this sector. Most of the offers and other promotional strategies are developed keeping this segment in mind.
- Corporate: Corporate communication includes the communication of information between two units in two different locations of a city, of a country or in two different countries. Telecom industries rely heavily on the corporate sector for its business. This segment in particular, contributes to the heavy daytime traffic. To shift daytime demand, mobile service providers offer lower tariffs to the individual segment, in the early mornings and late evenings when most corporate houses are closed.
- Rural: During the monopoly raj of the government owned service providers, the worst affected was the rural customers. Network coverage was limited and the quality of service provided was even worse. The telecom revolution of the late 80’s and early 90’s saw a change in the rural telecom scene. The rural telecommunication network expanded because of government’s policy on rural connectivity, to provide basic telephone services at subsidized prices. With the gradual improvement in the economic condition, changing lifestyle and stiff competition in the urban markets, private mobile operators also have increased their rural operations and increasing their subscriber base.
- Urban: The number of urban subscribers is significantly higher than rural subscribers. The reason cannot be attributed only to the better infrastructure, but also the educated subscriber base. Urban subscribers are more comfortable using mobile apps, and thus are users of both data and voice service. In fact, urban India has grown to become dependent on telecom services (Banerjee, 2011).

The telecommunication industry is segregated into the following segments-

- Fixed line/Wireless service
- GPRS service which include mobile internet
- GPS- mapping services
- 3G - 3rd Generation telecommunication
- Voice Mail and Video telecom services.
1.8 Dominant telecom service providers operating in India

Among the mobile service providers operating in twenty two telecom circles in India, the top players in terms of number of subscribers are Airtel with 200839755 subscribers, Reliance with 117648911 subscribers, Vodafone with 162188298 subscribers, Idea with 130217704 subscribers and BSNL with 94716915 subscribers (TRAI, 2014).

Vodafone (Vodafone Group Plc) is the largest mobile service provider globally and operates in over 27 countries across five continents (Bose, 2006). The company also markets some of its services in 14 additional countries, through partner network arrangement. Vodafone India started mobile telecom service in the year 1994. It operates in all the telecom circles in India and at present have 18.16 % market share. In India the largest subscriber base is of Airtel (Bharti AirTel Limited) with 22.48 % subscribers (TRAI, 2014) and extending its services to 23 states in India. Airtel have four business verticals – mobile service, media, enterprise and satellite TV. The company operates in 19 countries and serve approximately 1.8 billion people (Thirulogachander, 2006). Airtel is investing in capacity building actively and is laying undersea cables to link Africa with Europe (Economic Times, 2010).

Mobile tariffs tumbled when Dhirubhai Ambani entered the industry with the now famous phrase “We will make a phone call cheaper than a postcard”. Reliance Infocomm Limited’s aggressive marketing strategy and promotional campaigns ushered in a wind of change in the mobile industry. It offered a first of its kind technology in India (CDMA 1X technology), attractive products, price and promotional campaigns (Keskar, 2005).

Idea Cellular occupies the fourth place on the basis of total number of subscribers. Idea operates across all the telecom circles in India. The company was first to launch GPRS and EDGE service in India. The company is headed by Kumar Mangalam Birla (Idea Cellular, 2011).

In line with developments in the marketplace, sweeping changes has taken place in BSNL. Being a successor to a monopoly telecom operator, BSNL could enjoy privileges that no new players could have. To list these: BSNL owns cables and related landline assets like telephone exchanges, routers and rights to access cables through the nation. The company’s telephone exchanges were digital at the time of corporatization and many exchange buildings were in prime locations in cities and towns. BSNL owned the only existing National Long Distance cable network in the country (Sharma, et al., 2006). BSNL has a huge customer base for its landline telephone and internet-related services. Even in the face of stiff competition the company has shown a consistent growth in its subscriber base. Mr. Rakesh Kumar Upadhyay is the Managing Director of BSNL since 30th April 2011 (BSNL, 2014). In India BSNL is the first service provider to introduce 3G services.

Aircel was incepted in 1999 and became a regional leader in Tamil Nadu. The company is gradually extending to cover all the telecom sectors in India. The company is a JV between Maxis Communications, Malaysia and Sindya Securities Investments Private Limited of India. (Aircel, 2012). Its subscriber base was 68444071 in January 2104 (TRAI, 2014).
Tata DOCOMO is a JV between Tata Teleservices Limited and NTT DOCOMO of Japan. The company started operations in November 2008 in the GSM spectrum. On the CDMA platform, Tata Indicom, another concern of Tata Teleservice Ltd, operate and is popular in wireless data services using data card (Indian Express, 2014). Mr. Cyrus P. Mistry is the Director of Tata Teleservices Ltd (TATADoCoMo, 2012).

1.9 Indian telecom authorities

The telecommunication industry in India is headed by the Ministry of Communication and Information Technology. Different statutory bodies with different activities are grouped under this ministry.

1.9.1 Telecom Commission

The Telecom Commission was created in April, 1989. The primary objectives of the commission include formulation of telecom policy, see to matters related to international telecom alliances, encourage R&D in the industry and encourage private investment. (DoT, 2012).

1.9.2 Department of Telecommunications (DoT)

The Central Government is responsible for the installation and maintenance of telegraph and wireless equipment in India. The Central Government acts through the DoT. Significant activities of DoT include monitoring the licensing of new operators and liaise with international telecom organization. Along with telecom commission, DoT also encourages private investment and R&D in the industry.

1.9.3 Telecom Regulatory Authority of India (TRAI)

TRAI was created by the enactment of a special act the TRAI Act, 1997. Privatization in telecommunication industry required the creation of an independent regulatory body. TRAI was created so that a healthy competitive environment can be created for the mobile service providers to operate in. TRAI’s role can be summarized as being - recommendatory, mandatory, regulatory and judicial.
TRAI decides and recommends on fixing the tariff structure of telecommunication services (TRAI, 2013). DoT has the sole power for granting license after considering TRAI’s recommendations. However DoT may or may not accept TRAI’s recommendations (Economic Times, 2011).

1.9.4 Telecom Disputes Settlement and Appellate Tribunal (TDSAT)

The TDSAT was established in 2000. The tribunal functions to mitigate disputes between the licensor (DoT) and the licensee (mobile service provider). It also resolves disputes concerning a mobile service providers and subscribers.

1.9.5 Wireless Planning and Co-ordination Wing (WPC)

WPC was established as a separate department within DOT in 1952, mainly for overseeing the frequency spectrum management and licensing. WPC represents India at the international organizations and forums.

1.9.6 Technical body for equipment approvals (TEC)

TEC functions as a quality evaluator for equipments used in the telecom industry of both foreign and Indian origin that are installed and used in India. Prior approvals are required by the telecom service providers for installing equipment.

1.10 Mobile transmission network

The mobile transmission area is known as cells. Each cell is equipped with a receiver transmitter set or BTS (Base Terminal Station). Another indispensable equipment is the switch, which coordinates between the transmitter and handset when a subscriber crosses to another cell. Mobile telephone system is capable to support simultaneous users, which is done through ‘frequency reuse’. Because of this technology, valuable band width and other resources can be shares by many mobile subscribers (Umar, 2004).

1.11 Mobile telecommunication spectrum

The Indian mobile network is dominated by the GSM (Global system for Mobile communication) technology. It has a market share of 85 percent. Another technology used mostly in USA and some European countries is the CDMA (Code Division Multiple Access) technology. GSM technology is widely used in India and operates in the 900 – 1800 MHz band. The Mobile operators which started operations in India from the beginning, like Airtel and Vodafone generally operate in the 900MHz frequency belt and are at a cost advantage. Radio waves in this frequency have greater penetration capacity.

Second-generation (2G) wireless telephone technology was first used for civilian communication in Finland in 1991 (On Elisa, 2012). After 2G was introduced and became an industry standard, the previous mobile telephone system was named 1G. The 2G network is
suitable for voice services, but inefficient for carrying data signals. Gradually alternate technologies like 2.5 (GPRS), 2.75G (EDGE), 3G (Third Generation) and 4G (Fourth Generation) services started to emerge which were capable to carry both voice and data services. 2G technologies are based on multiplexing. It is a technology used in telecom and computer networks by which multiple message signals or data streams are combined into one signal over a shared medium. The aim is to share an expensive resource like cable or wireless bandwidth. In mobile telecommunications, several calls may be carried using one wire (Ashiho, 2003).

The 2G, GSM standard for mobile signal transmission is time tested and popular network with existing operational infrastructure. Subscribers at will can change their SIM (Subscriber Identity Modules) card and cheap handsets are available in the market. GSM is used in most countries which makes international roaming possible. As this network has a huge subscriber base, service providers are much interested in creating and maintaining a GSM network. However, GSM network suffers from some drawbacks, like it creates electrical interferences for some electronic instruments. Intellectual property right of this technology is with a few industry participants, which creates an obstacle for new entrants. GSM tower has limited transmission range of 35 Km.

CDMA is used extensively in America and parts of Asia. CDMA was introduced in India by Reliance Communication. Globally CDMA has about 15% share in terms of usage by subscribers. Some CDMA operators are switching to GSM technology as it is more popular with subscribers (Natarajan, 2006). CDMA network can support larger number of subscribers and is energy efficient. A remarkable character of CDMA network is that it can maintain a call with lower signal levels. Like the GSM network, CDMA also has certain drawback. Most patent of CDMA technology is owned by Qualcomm Inc, of USA.

The GSM technology went through a phase of incremental innovation with the introduction of 2.5G and 2.75G or EDGE (Enhanced Data rates for GSM Evolution). From the previous mobile transmission technologies, 3G evolved (Third Generation). 3G is suitable for voice call, mobile internet, video calls and mobile TV. 3G services offer better and reliable data service (Mitra, 2009). 4G (fourth generation) network standard is a successor of the 3G network. This system is suitable for delivering mobile broadband data service through USB data cards, smart phones etc. With the introduction of this technology, various value added services like IP telephony and online gaming have become feasible. Bharti Airtel first introduced 4G in India in Kolkata on 10 April 2012 (Times of India, 2012).

1.12 Telecom infrastructure

The telecom industry is characterized by high initial start up cost, especially in setting up infrastructure. The telecom policy of India permits the telecom operators to share passive infrastructure like building and tower. High technology is involved, most of which are of foreign origin. Acquiring these technologies, installing the required infrastructure and their
Routine maintenance increases the operating cost of the operators. Infrastructure sharing reduces such cost.

Mobile towers are of two types, based on their installation—ground and rooftop. The towers require an investment of approximately Rs. 25 Lakh (ICRA Rating Feature, 2009).

The mobile towers generally owned, maintained and leased out by a different set of companies. These independent tower infrastructure companies lease their tower to multiple tenants or mobile service providers who put up their equipment on the tower (Nishith Desai Associates, 2011).

**Passive infrastructure:** Passive infrastructure has developed into a separate industry to assist and serve mobile service providers. Sharing of resources helps in reduce cost.

**Active Infrastructure:** Active Infrastructure consists of telecom equipments that transmit the mobile signals (COAI, 2008). These groups of infrastructure consist of antennas, cables and other transmission equipments.

One of the entry barrier faced by new mobile service providers are removed because of these tower companies. (ICRA Rating Feature, 2009).

**1.13 Foreign Investment in Telecom Sector in India**

Rapid growth of the telecom industry made installation of modern telecom infrastructure extremely important. The primary catalyst for the rapid growth in this sector is the liberalization of policy especially in the area of FDI (DoT, 2012). Between the financial year 2000 to 2012, the industry attracted US$ 12560 million is invested from FDI source in telecommunication (Indiain Business, 2012). Attractive policy reforms regarding FDI have made India a ideal place for both mobile service providers as well as equipment manufacturers (FICCI, 2012). Few such constructive policies which have encouraged FDI are:

- No industrial license is required for establishing telecom equipment manufacturing unit.
- For manufacturing of telecom equipments in India 100% Foreign Direct Investment (FDI) is permitted under present policies.
- Currently, the maximum foreign investment or equity partnership permitted is 74% The government has been advised however to increase FDI to 100 %, but presently it is limited to 74% (Sanyal, 2012)

The Indian FDI policy in telecommunication is differ sector wise, like in software development 100% foreign equity is permitted but in some area FDI is allowed with certain restrictions, like in wireless mobile service (Majumdar and Bhattacharya, 2014). Investments in some sectors are allowed without prior government permission i.e. through the automatic route. For some areas prior permission is required with a long waiting periods and complex
documentation formalities. The industry always has invited lot of political, media and public attention and sympathy. For a long period the general objective of the government was that the majority equity should be with the Indian partners. As a result FDI was restricted to a maximum of only 49%. In 2005, in a landmark decision the government increased the FDI to 74% (Economic Times, 2007). The benefit of FDI is multi facet. It helps in the flow of money required to start the company, fund infrastructure building and also transfer of technology. FDI influences a country’s trade balance, increasing labor standards and skills, creation of employment and rejuvenating the general business climate.

1.14 Characteristic features of service and its marketing

The global economy today is increasingly recognized as a service economy. Nowadays the service sector is regarded as an indicator to a country’s economic prosperity. Presently, service industry contributes approximately 50% to India’s GDP. The Indian economy has moved from being a manufacturing based economy to a service economy (IBEF, 2014). This scenario is not only observed in India alone, but is a global phenomenon. More emphasis is therefore seen in the area of services marketing. Marketing a service product is challenging and different than marketing tangible goods. Service products have unique characters like intangibility, heterogeneity, perishability and inseparability which make marketing difficult (Lovelock and Wirtz, 2011). These characters of a service product have extended the marketing mix to include Process, People and Physical evidence. A service is heavily dependent on the quality of people, their behaviour and skill. One of the important variables in service marketing involve maintaining positive and long time relationship with the customer (Verma, 2012). Relationship marketing helps in branding and keeping competitors in check.

Dick and Basu (2012) mentioned that Christopher H. Lovelock in his book titled ‘Service Marketing’ has articulated five parameters to determine service category; based on service nature, relation with customer, process through service reach customer, demand and level of customization. A service based organization, unlike a manufacturing one, does not manufacture but performs something for the customer. A service firm delivers an experience that is intangible, heterogeneous, inseparable and imperishable in character (Dick and Basu, 2012). Therefore marketing of services is different from that of a tangible product. Over the past years service firms have modified their marketing and operational approach as a result of changing business environment. Fierce competition in the service industry, low margins, similar service provided by competitors and the realization that customer satisfaction can ensure long term survival, has been acknowledged as causes for the evolution of the traditional service firm into a modern one (Liljander and Strandvik, 1993).

Firms have understood that although no two customers are same in their purchase preferences or requirement, some of their purchasing patterns are similar. Developing marketing strategy requires the identification of customer groups with similar needs, through the process of segmentation. Targeting the profitable segment and developing service innovations along with maintaining consistent quality makes a company stand out from competition (Saxena,
A new concept has evolved pertinently termed, mass customization. Firms gain from the benefits of reduced cost but could fairly meet the needs of a large group of customers. Segmenting and targeting the market is followed by positioning strategy through which a company creates an image based on attributes on the mind of customers. Positioning helps create a separate identity for a company or brand and is a powerful marketing technique in a competitive market (Ramaswamy and Namakumari, 2013). In the case of a service product, delivering quality service constantly creates an advantage for service providers (Zeithaml, et al, 2013). Understanding the level of customer expectations and tolerance range is thus required.

**1.15 Marketing strategy in mobile telecommunication service**

Mobile telecommunication services being predominantly a service product, has some distinctive characters. It is a technology driven industry and there is a constant need for acquiring new technology, mostly from foreign patent holders. There is a long gestation period for recovery of investment. Marketing strategy varies based on different customer segments like- individual/organizational subscriber or rural/urban subscriber. On the basis of the service product also the market can be segmented. New entrants before entering the Indian telecom industry need to initially evaluate the external and internal environment. An internal environmental appraisal is done by analyzing its own competences and limitations Market opportunities need to be exploited and threats noted. The 7 P’s or extended marketing mix, proposed by Booms and Bitner is a marketing strategy tool that extends the number of controllable variables from four in the traditional marketing mix model to seven. The 7 P’s model is relevant for service industries like mobile telecommunication. The model is described below in the context of the present study (Leadley and Forsyth, 2004).

**Product:** Technology and the changing needs of customers have prompted the telecom industry to introduce different services to customers. This has also helped some of the players create a new market for their services, instead of competing with other players in the cluttered market. Telecom players are now forced to continuously introduce innovative services to sustain and thrive in the highly competitive market. The various products and services offered by telecom industry are discussed below:

*Fixed (land) line-* Fixed line service allowed customers to communicate only from a fixed location using a telephone connected by wire. The common landline connection offered by BSNL is a basic service. The services under fixed land line are of two types:

(a) **Short distance or local service**- These services allowed users to communicate with people within a particular geographic region. For example, a person residing in Delhi can communicate only with people in Delhi. The requirement for local distance services is met by the electronic exchanges set up at various locations offering digitized Public Switched Telephone Network (PSTN) system.

(b) **Long distance service**- This service include national and international connectivity. National connectivity service allows a customer to communicate with people residing
anywhere in the country. International connectivity service allowed the customers to communicate with people residing anywhere in the world. Initially this service was offered by the government owned VSNL (Videsh Sanchar Nigam Limited).

Mobile Service- Mobile or cellular services allow customers to communicate while on the move. Mobile service providers divide a region into cells and establish Ground Based Towers (GBTs) in each cell. All GBTs are connected to a central switching center from where the entire system is monitored. Mobile service providers offer limited mobility and roaming facilities. Limited mobility allows users to communicate within a given area. Roaming facility allows users to communicate over mobile from any part of India. Some service providers also offered international roaming. Mobile services can be categorized as follows:

(a) Voice service: This is the most popular and basic service offered by a mobile service provider. It includes the voice call between mobile subscribers.
(b) Pager service: This service comprise of short messaging service, popularly known as SMS (Short Message Service). It has become a great marketing tool and is being used for promotional activities (Banerjee, 2010).
(c) Internet: It allows people to access information using the World Wide Web (www) through their mobile using a web browser. Through mobile internet various types of apps can be used for multiple applications like online gaming, email and downloading songs.
(d) Video telecom services: They include video conferencing, video chatting, etc. Various companies like transport companies, hospitals, educational institutes, etc. use this service.
(e) Other Services- Apart from the above services, some services like fax (using Very Small Aperture Terminal-VSAT networks), voice mail, card dialing are also offered by telecom players.

Price: Mobile Service providers can use cost-based, competition based or demand-based pricing. Most service providers in the telecom industry today are restoring to competition based pricing, which has led to low prices of the service. This however has proved to be beneficial for the customers, but telecom companies are struggling to make profits. In the fixed line telephone, customers have only the postpaid system of bill payment. Customers pay a fixed rental and usage charge. In the mobile industry, service providers offer two options to customers, prepaid and postpaid. In case of prepaid service, customers recharge or top up their mobile as per their need some from a retail outlet. The recharge covers the rent fixed by the service provider plus the cost of a certain amount of airtime. This type of recharge can also be done through paper voucher purchased from a retailer or through the internet.

Place: During the pre liberalization era, customers had to visit different departments to get different set of work done; for example, applying or transferring a new connection, bill payments, registering complains etc. This came to an end with the entry of private players. Most of the private telecom companies have offices at convenient locations, and provided
multiple services through them. The private mobile operators also automated some services and made many services accessible through the internet. BSNL also upgraded their service format and through e-seva centers started receiving application for new connection, transfer and receive payments (The Hindu, 2005). Mobile service providers like Airtel, Vodafone and Reliance have one-stop shops. These shops operate on franchisee basis and subscribers can take advantage of the various services like bill payment, recharge, change service plan, apply for a new connection and also buy a mobile handset.

**Promotion:** Telecom service providers use direct marketing, advertisements in newspapers, TV, Radio, billboards and point of purchase displays etc. to promote their services. In 2002 Airtel used a TV commercial endorsed by a successful music composer, A.R. Rahman to promote its brand. Rahaman also composed five exclusive symphonies downloadable as ring tones for Airlel users (Economic Times, 2012). Telecom service providers also sponsor contests or events to attract public attention and gain publicity. Owing to the intense competition in the cellular service sector, the promotion campaigns are quite innovative. Vodafone for example, launched an advertising campaign using an animated character ZooZoo, which caught the attention of customers (Economic Times, 2014). An efficient promotion campaign develops awareness and strengthens the brand.

**People:** Customer orientation is crucial for winning new customers and retaining the existing customers. When customers report any problem with the service, service provider should address the problem and get it rectified. However, when BSNL/DOT enjoyed a monopoly, customer care feedback was poor. The new private players emphasized more on customer satisfaction. They ensured that their service personnel answer customer queries promptly and professionally and attend to their problems immediately. This has brought a change in the working of the telecom industry as a whole (Strouse, 2004).

**Physical Evidence:** As the telecom service is intangible, a user cannot judge the quality of the service before using it. Telecom service providers, however, offer some tangible products to customers to serve as physical evidence. When Tata Teleservices entered telecom sector, it gave sleek and attractive looking handsets to its subscribers to compete with the handsets given by Reliance. Telecom service providers also focus on ambience of their service outlets. Reliance invested about Rs. 1 Crore on its service outlets named Reliance web world (Franchise India, 2014).

**Process:** Telecom service providers should offer reliable, continuous, quality service to customers. When Tata Teleservices entered the telecom industry, its sales executives visited individual homes, shops and organizations, to identify people in need of new phone connections. Now prospective customers can get a pre-activated SIM on submission of the required documents. Computerized system and IVR (Interactive Voice Responder) system can handle multiple queries from subscribers. Telecom service providers should continuously strive to improve their service delivery process. However, care should be taken that it is done without incurring excessive cost (Kapoor et al, 2010).
1.16 Global trends in telecommunication

The large scale investment and long term commitment required to survive in telecom industry keeps small and medium players away from the industry. For this reason, only a few big companies such as AT&T, Verizon, MCI, Bell South and SBI communications operate and have majority market share in the global telecommunication market (Moorman et al., 1992). In this industry, huge investment is required for setting up the desired infrastructure like optic fiber network and other high technology equipments. Breakeven period is generally long, and during the period, if competitors enter the market, price war starts, which extends the time to obtain return on investment. Often the existing technology becomes obsolete and the service provider may need to make additional investments. Therefore, in most countries, only one or a few big players dominate the telecom industry. For example, in India, government owned BSNL is a major player; in Japan, NTT DoCoMo is the largest cellular service provider; in Germany, T-Mobil and Vodafone are leading cellular operators and in the US, AT&T is the major player (Mattos and Coutinho, 2005). Continuous R&D in the telecommunication industry is one of the many factors responsible for globalization in the telecom industry. For example, NTT DoCoMo established an R&D center in Europe to conduct research related to network infrastructure and security transactions. In South Korea, it worked with SK Telecom Company to conduct research on W-CDMA (Wideband CDMA) technology. To exploit the opportunities in the market, Sweden based Ericsson, a major player in the global telecom market, invested in a R&D center in China. Through this center, Ericsson and China Academy of Telecommunications Technology will exchange knowledge of 3G communication systems (Sharma, 2004).

In 1990s telecommunication industry across the globe registered very high growth rates. However, at the end of the century, the economy took a downturn and telecom players started facing problems with a decline in business. However, with the improvement in the economy by 2003-2004, global telecom industry picked up. According to Telecommunication Review and Forecast, published by the Telecommunications Industry Association, in the US alone, telecom industry will register a growth rate of 9.2% in the coming years and generate revenue in excess of $1 trillion (Paul, 2011). China, with its vast population base and increasing spending of people, is presently the largest market for cellular operators in the world.

1.17 Conclusion

For many years, after Graham Bell invented the phone, it was used only voice based communication. GSM (Global System for Mobile) technology brought a revolutionary change in the world of communication and facilitating communication on the move, using a handheld mobile device. Mobile service operators offered various non-voice services like SMS and mobile internet, which slowly made mobile communication popular and user friendly. Introduction of optic fiber cables also brought drastic changes in the field of telecommunication. A single pair of optic fiber can transmit 300 billion bits per second, i.e. 50,000 phone calls simultaneously (Jhunjhunwala, 1999). Code Division Multiple Access (CDMA) is also another significant development in the telecom sector, which allows multiple
mobile phone users to share the same frequency band, by transmitting simultaneous signals. Now global companies as well as some Indian mobile service providers are focusing on W-CDMA (Wideband CDMA) and 3G to further improve network quality. However, the pace of technology innovation is so high, mobile service providers are always at risk of their innovation becoming obsolete even before its launch or acceptance by customers.

In India, the government owned telecom service providers like BSNL and MTNL dominated the telecom industry for several years. It was only in 1994 that the telecom industry was opened to private players. This decision of the government changed the face of the Indian telecom industry. Price wars started and call charges reduced to such a level that even the common man could think of having a mobile phone connection. With competition, efficiency in the sector increased and phone connections, which earlier took a year to be sanctioned earlier, began to be issued instantly over the counter. The concept of customer service that was almost nonexistent, gained importance with both government and private players vying for larger market share.

The telecom industry in India is presently, only second to that of China is subscriber base and having the lowest tariff structure in the world. In China, there are only three major telecom service provider, but India have 21, operating in 22 telecom circles (The Telegraph, 2011). The industry contributes 2% of our countries GDP and provides direct employment to approximately 3 million people (COAI and PWC, 2011). Frost and Sullivan report illustrate that the telecommunication market in India is expected to increase to 1200 million by 2017 (Frost and Sullivan, 2012). The tele-density in India is expected to increase by 10% because of the aggressive marketing efforts of telecom players. Major mobile telecom service providers of India are BSNL, Airtel, Vodafone, Reliance, TATA Docomo, Aircel and Idea. According to a report presented by NASSCOM, mobile service will be the fastest growing industry in India (NASSCOM, 2012).

Telecom players are reducing their prices drastically to attract customers and increase their market share. The price war has extended from the voice service to other services like mobile internet and SMS. Therefore, telecom players are concentrating on effective utilization of existing infrastructure and enhancing customer service experience. According to TRAI, some service providers are not able to meet the benchmark for quality standards. For example, according to TRAI, broadband refers to a download speed of 256 Kbps (TATA, 2013). However, few ISPs offer the service of this quality.

Presently many mergers and acquisitions are taking place in industry globally. The mergers are commonly horizontal mergers, where merger or acquisition occurs in the same industry between two different telecom service providers. Tata’s merged with Birla-AT&T; Bharti Telecom acquired Spice Telecom and entered into strategic tie-up with BPL cellular. Further, Tata Teleservices acquired VSNL in 2002. To enhance its basic telephone service business, Tata also tied up with Hughes Telecom and later with Docomo of Japan. There may be further consolidation in the telecom industry, leading to only a few major players operating in the industry (Watch, 2013).
This chapter presented the background to the research study and illustrated the present state of the Indian mobile telecommunication industry, certain historical perspectives and appraised business environment of mobile service providers. The next chapter, Chapter 2, will discuss the literature review, which focuses on three main areas: (1) Indian mobile industry; (2) Influence of brand and brand loyalty; and (3) Study papers on some mobile service providers operating in India.