Mobile Phone Services in India:
An Overview
CHAPTER – II

MOBILE PHONE SERVICE IN INDIA: AN OVERVIEW

2.1 INTRODUCTION

Over the last few years the use of mobile phones has increased dramatically throughout the world, especially in India, next to China, where mobile phones and services are already a multi-billion rupee industry. A new survey on mobile phone usage in India, conducted by Cellular Operators Association of India (COAI)\(^1\), has found that the continent is now the fastest growing mobile phone market in the world, and the first continent to have more mobile phone users than land-line subscribers. The telecommunications environment in India has experienced immense changes and has grown substantially over the last decade. So, in this chapter an attempt is made to overview the mobile phone service sector in India.

2.2 HISTORY OF CELL PHONE

Martin Cooper, a former general manager for the systems division at Motorola, is considered the inventor of the first modern portable handset. Bell Laboratories introduced the idea of cell phone communications in 1947 with the police car technology. However, Motorola was the first to incorporate the technology into a portable device that was designed for use outside an automobile.

By 1977, AT&T and Bell Laboratories had constructed a prototype cellular system. A year later, public trials of the new system were started in Chicago with over 2000 trial customers. In 1979, in a separate venture, the first commercial cell phone system began its operation in Tokyo. In 1981, Motorola and American Radio Telephone started a second U.S. cell phone radio-telephone system test in the Washington/Baltimore area. By 1982, the slow-moving FCC finally authorized commercial cellular service for USA. A year later, the first American commercial analogue cell phone service or AMPS (Advanced Mobile Phone Service) was made available in Chicago by Ameritech. Despite the incredible demand, it took 37 years for cell phone services to become commercially

\(^1\) www.coai.com
available in the United States. Consumer demand quickly outstripped the 1982 system standards. By 1987, cell phone subscribers exceeded one million and the airways were crowded (COAI 2005).

In 1991, the second generation (2G) cellular technology was launched in Finland by Radiolinja on the GSM standard, which sparked competition in the sector as the new operators challenged the incumbent 1G network operators. Ten years later, in 2001, the third generation (3G) was launched in Japan by NTT DoCoMo on the WCDMA standard. This was followed by 3.5G, 3G+ or turbo 3G enhancements based on the high-speed packet access (HSPA) family, allowing Universal Mobile Telecommunication Systems (UMTS) networks to have higher data transfer speeds and capacity.

2.3 CELL PHONE AND ITS WORKING

Cell phone is an electronic device, which connects people around the world. It is similar to a Walkie – Talkie. The difference between a cell phone and a walkie-talkie is that two people can communicate at the same time through cell phones and only one person can talk at a time with a walkie-talkie, cell phone uses two frequencies, which is why one can talk and listen at the same time. Cell phone can travel from area to area or cell to cell (cell phone tower coverage area) as device out. The only limit to where the cell phone can go is how many towers are there to carry and transmit the frequencies. This is a remarkable improvement over radio telephones which carry the signals from one control antenna with a range of less than 50 miles. Basically, cellular radio provides mobile telephone service by employing a network of cell sites, distributed over a wide area. A cell site consists of a radio transistor and a base station controller which manages to send and receive traffic from the mobiles in its geographical area to a cell phone switch. It also employs a tower and antennas, and provides a link to the distant cellular switch called a Mobile Telecommunication Switching Office (MTSO). Advanced mobile phone service using a novel cellular approach operates in 25 to 45 MHZ Bands and 870 to 890 MHZ Bands and 1800 MHZ (Dual Bands). Recently, the large number of channels available in the new bands has made cellular approach more practical. It is the usage of frequency which enables a person to talk and listen at the same time. On a „complexity per cubic inch‘ scale, cell phones are some of the most intricate devices people play with
on a daily basis; modern digital cell phones can process millions of calls per second in order to compress and decompress the voice stream. Because of these facilities in cell phones, the demand for them increases tremendously and so the companies providing services and channels of service also increase much.

2.4 MOBILE PHONE TECHNOLOGY

First-generation (1G) mobile phones had only voice facility. These were replaced by second-generation (2G) digital phones with added fax, data, and messaging services. The third-generation (3G) technology has added multimedia facilities to 2G phones.

The theory of electromagnetic radiation was propounded by Clark Maxwell in 1857 and explained mathematically the behaviour of electromagnetic waves. Then G. Marconi invented transatlantic radio transmission using electromagnetic waves in 1901. However, as the bandwidth of these transmission systems was very small, the transmission of information was very slow. Though the electromagnetic waves were first discovered as a communications medium at the end of the 19th century, these were put in use for the masses very late. The first systems offering mobile telephone service (car phone) were introduced in the late 1940s in the US and in the early 1950s in Europe. These single cell systems were severely constrained by restricted mobility, low capacity, limited service, and poor speech quality. Also the equipment was heavy, bulky, expensive, and susceptible to interference.

2.4.1 The First Generation (1G)

First generation (1G) mobile phones were based on the analogue system. The introduction of cellular systems in the late 1970s was a quantum leap in mobile communication, especially in terms of capacity and mobility. Semiconductor technology and microprocessors made smaller, lighter, and more sophisticated mobile systems a reality. However, these 1G cellular systems still transmitted only analogue voice information. The prominent ones among 1G systems were advanced mobile phone system (AMPS), Nordic mobile telephone (NMT), and total access communication system (TACS). With the introduction of 1G phones, the mobile market showed annual growth rate of 30 to 50 per cent, rising to nearly 20 million subscribers by 1990.
2.4.2 The Second Generation (2G)

Second generation (2G) phones using global system for mobile communications (GSM) were first used in the early 1990s in Europe. GSM provides voice and limited data services, and uses digital modulation for improved audio quality.

Multiple Digital Systems: The development of 2G cellular systems was driven by the need to improve transmission quality, system capacity, and coverage. Further advances in semiconductor technology and microwave devices brought digital transmission to mobile communications. Speech transmission still dominates the airways, but the demand for fax, short message, and data transmission is growing rapidly. Supplementary services such as fraud prevention and encryption of user data have become standard features, comparable to those in fixed networks. 2G cellular systems include GSM, digital AMPS (D-AMPS), code-division multiple access (CDMA), and personal digital communication (PDC).

Today, multiple IG and 2G standards are used in worldwide mobile communications. Different standards serve different applications (paging, cordless telephony, wireless local loop, private mobile radio, cellular telephony, and mobile satellite communication) with different levels of mobility, capability, and service area. Many standards are used only in one country or region, and are incompatible. GSM is the most successful family of cellular standards. It includes GSM900, GSM-railway (GSM-R), GSM1800, GSM1900, and GSM400. GSM supports around 250 million of the world’s 450 million cellular subscribers, with international roaming in approximately 140 countries and 400 networks.

The core network: This network links together all the cells into a single network, coordinates resources to hand over your call from one cell to another as you move, discovers where you are so that you can receive incoming calls, links to the fixed network so that you can reach fixed-line phones, and communicates with roaming partners. You can use your phone on other network links to the Internet, so you can reach Web servers and corporate systems worldwide to control and deliver services depending on your subscription profile.

The 2G architecture: The existing mobile network consists of the radio access network (comprising cells and backhaul communications) and the core network (comprising trunks, switches, and servers). Mobile switching centres (MSCs) are intelligent servers and the whole network is data-driven, using subscription and authentication
information held in the home location register (HLR) and authentication centre (AuC). The standard services include circuit-switched voice, fax, and data, as well as voicemail and voicemail notification. Additional services include wireless application protocol (WAP), high-speed circuit-switched data (HSCSD), mobile location services (MLS), and cell broadcast. You can change to a new operator keeping your old phone number.

2.4.3 The Third Generation (3G)

The 3G technology adds multimedia facilities to 2G phones by allowing video, audio, and graphics applications. Over 3G phones, you can watch streaming video or have video telephony. The idea behind 3G is to have a single network standard instead of the different types adopted in the US, Europe and Asia. These phones will have the highest speed of up to 2 Mbps, but only indoors and in stationary mode. With high mobility, the speed will drop to 144 kbps, which is only about three times the speed of today’s fixed telecom modems. 3G cellular services, known as Universal Mobile Telecommunications System (UMTS) or IMT-2000, will sustain higher data rates and open the door to many Internet style applications. The main characteristics of IMT-2000 3G systems are:

1) A single family of compatible standards that can be used worldwide for all mobile applications.
2) Support for both packet-switched and circuit-switched data transmission.
3) Data rates up to 2 Mbps (depending on mobility).
4) High spectrum efficiency.

IMT-2000 is a set of requirements defined by the International Telecommunications Union (ITU). ‘IMT’ stands for International Mobile Telecommunications and ‘2000’ represents both the scheduled year for initial trial systems and the frequency range of 2000 MHz. The most important IMT-2000 proposals are the UMTS (W-CDMA) as the successor to GSM, CDMA2000 as the successor to interim-standard ‘95 (IS-95), and time-division synchronous CDMA (TDSCDMA) and UWC-136/EDGE (Enhanced Data for Global Evolution) as TDMA (Time Division Multiple Access) based enhancements to D-AMPS (Digital Advanced Mobile Phone Service) / GSM—all of which are leading previous standards towards the ultimate goal of IMT-2000.
UMTS increases transmission speed to 2 Mbps per mobile user and establishes a global roaming standard. UMTS is a so-called 3G, broadband standard for packet-based transmission of text, digitised voice, video, and multimedia at data rates up to and possibly higher than 2 Mbps, offering a consistent set of services to mobile computer and phone users, no matter where they are in the world. Based on the GSM communication standard, UMTS, endorsed by major standards bodies and manufacturers, allows mobile users to have the constant access to the Internet and the same set of capabilities irrespective of their location. Users gain access through a combination of terrestrial wireless and satellite transmissions. Until UMTS is fully implemented, users can have multi-mode devices that switch to GPRS (General Packet Radio Service) or EDGE technology where UMTS is not yet available.

Today’s cellular telephone systems are mainly circuit-switched type, with connections always dependent on the circuit availability. With UMTS, the packet-switched connection using the IP means that a virtual connection is always available to any other end point in the network. This makes it possible to provide new services such as alternative billing methods (pay-per-bit, pay per-session, flat rate, symmetric bandwidth, and others). The higher bandwidth of UMTS also promises video conferencing and the virtual home environment. In virtual home environment, a roaming user can have the same services as at home or in the office, through a combination of transparent terrestrial and satellite connections.

The 3G promises increased bandwidth, up to 384 kbps when the device holder is walking, 128 kbps in a car, and 2 Mbps in fixed applications. In theory, 3G would work over North American as well as European and Asian wireless air interfaces. A new air interface called enhanced data GSM environment (EDGE) has been developed specifically to meet the bandwidth needs of 3G. EDGE is a faster version of GSM wireless service. But the outlook for 3G is neither clear nor certain. Part of the problem is that network providers in Europe and North America currently maintain separate standards bodies. In addition to technical challenges, there are financial issues that cast a shadow over 3G’s desirability.

2.4.4 The Fourth Generation (4G)

The 4G mobile communications will have transmission rates up to 20 Mbps — higher than of 3G. 4G is being developed with the following objectives:
1. Speeds up to 50 times higher than of 3G. However, the actual available bandwidth of 4G is expected to be about 10 Mbps.

2. Three-dimensional virtual reality – imagine personal video avatars and realistic holograms, and the ability to feel as if you are present at an event even if you are not. People, places, and products will be able to interact as the cyber and real worlds merge.

3. Increased interaction between corroborating technologies; the smart card in your phone will automatically pay for goods as you pass a linked payment kiosk, or will tell your car to warm up in the morning as your phone has noted you leaving the house.

Ericsson and the University of California are jointly researching CDMA wireless access technology, advanced antenna systems, next-generation mobile Internet, quality of service, power amplifier technology, and wireless access networks. Other 4G applications include high-performance streaming of multimedia content based on agent technology and scaleable media coding methods. 4G will solve problems like limited bandwidth in 3G when people are moving and uncertainty about the availability of bandwidth for streaming to all users at all times.

One of the key requirements is to realise a wireless 4G IP-based access system. The ultimate objective is to create a protocol suite and radio communication schemes to achieve broadband mobile communication in 4G wireless systems. Dubbed 4G, the i-mode technology will offer data transmission rates up to 200 times higher than 2G at 20 Mbps. 3G data rate is currently 2 Mbps, which is very high compared to 2G’s 9.6 kbps. 4G builds on the 3G standard, integrating and unifying the different interfaces (W-CDMA, CDMA2000, EDGE, etc). The development of 4G expands upon current i-mode technology that has gained wide success in Japan. The streamlined and unified wireless Internet technology works through iHTML to provide a high quality Web service. i-mode has speeded up data transmission of up to 40,000 Internet sites for users. Charges are based on the amount of data transmitted rather than the time spent on it. AT&T has launched the M-mode service tailored to the US market. The service is based on WAP technology, and offers a dual browser with i-mode.

2.5 IMPORTANCE OF MOBILE PHONE

Communication is the transfer of information from person to person. This may be in form of sound transmission such as human speech, the beating of the drum, or even the
bird's call. It can also be in a form that requires sight like writing, pictures, and signals, gestures and a form that requires the utilization of other senses. Almost everything that will make a noise has been use for signalling at one time or another same with a teaser it can be used in many ways to protect you from danger. In life and business, communication is one of the significant skills one can have.

There are many means on how you can reach out to other people to communicate and one of this is the use of a mobile cell phone. It can be used for business calls that binds two or group of people to convey messages to each other and these are possibly made for colleagues and business men or employers to conduct business and meetings anytime, anywhere. This is gradually important for all employees to acquire natural business communication skills. With technology you can consider uniting home and work place. Professional consistent skills in communication are of the highest importance.

Today, cell phones provide unbelievable collections of functions just like a teaser which can be of many purposes to give you protection. For personal calls, users of cell phones can practise and learn communication skills by respecting and following the rules of conservative communication. If you are in public places do not hold a loud talk about a personal nature. When you are dealing with service personnel's you can hang up your phone and focus on a direct communication.

In a long distance communication you can use a mobile cell phone to keep in touch from your love ones that are away from you. This was being invented for an easy access and was used by many people globally. There are many forms of communication that you can prefer for you to mingle with other individuals to specify one you can own a cell phone for faster rely of messages to your friends as well as your family just like a teaser which delivers fast and effective stunning effects in just less than five seconds. Through communicating this way, you can still feel their presence and assure you that they are always there for you no matter how distant they are. A constant communication is very significant between you and your loved ones.

It is a precious communication skill if you really understand and know the use of a certain technological devices together with applications appropriately. Because of cool
and transitory nature of text messaging, this should not be used in a manner of emotionally or a long charged of communication and if you are in face to face interactions with other individuals.

To communicate is to reach out to people who are close to you and give time to share how you miss that person or during business and meetings you will be able to connect easily to your co employees or boss. With cell phones it should be use in a nice way that you can benefit out of it for its easy accessibility. You will not exert more effort to interact and you can do this anytime you want to. List of top 10 countries by number of mobile phone in use is shown in Table 2.1.

**Table 2.1**

<table>
<thead>
<tr>
<th>Rank</th>
<th>Country of Origin</th>
<th>Number of Mobile Phones (Million)</th>
<th>Population (Million)</th>
<th>Mobile Phone % of Population</th>
<th>As on Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>China</td>
<td>1,020,000,000</td>
<td>1,341,000,000</td>
<td>76.06</td>
<td>March 2012</td>
</tr>
<tr>
<td>2</td>
<td>India</td>
<td>919,170,000</td>
<td>1,210,193,422</td>
<td>75.95</td>
<td>March 2012</td>
</tr>
<tr>
<td>3</td>
<td>Unites States</td>
<td>327,577,529</td>
<td>310,866,000</td>
<td>105.38</td>
<td>June 2011</td>
</tr>
<tr>
<td>4</td>
<td>Brazil</td>
<td>253,982,000</td>
<td>192,379,287</td>
<td>132.02</td>
<td>May 2012</td>
</tr>
<tr>
<td>5</td>
<td>Indonesia</td>
<td>250,100,000</td>
<td>237,556,363</td>
<td>105.28</td>
<td>May 2009</td>
</tr>
<tr>
<td>6</td>
<td>Russia</td>
<td>224,260,000</td>
<td>142,905,200</td>
<td>156.93</td>
<td>July 2011</td>
</tr>
<tr>
<td>7</td>
<td>Japan</td>
<td>121,246,700</td>
<td>127,628,095</td>
<td>95.00</td>
<td>June 2011</td>
</tr>
<tr>
<td>8</td>
<td>Pakistan</td>
<td>114,610,000</td>
<td>178,854,781</td>
<td>64.08</td>
<td>Jan 2012</td>
</tr>
<tr>
<td>9</td>
<td>Germany</td>
<td>107,000,000</td>
<td>81,882,342</td>
<td>130.68</td>
<td>2009</td>
</tr>
<tr>
<td>10</td>
<td>Nigeria</td>
<td>90,583,306</td>
<td>140,000,000</td>
<td>64.70</td>
<td>Feb 2011</td>
</tr>
<tr>
<td></td>
<td>Worldwide</td>
<td>Over 5.6 billion</td>
<td>7,012,000,000</td>
<td>79.83</td>
<td>2011</td>
</tr>
</tbody>
</table>


According to table 2.1 China is ranked first in the list followed by India and United States. In United States, Brazil, Indonesia, Russia and Germany number of mobile phones in use has been more than the size of the population. This shows that substantial number of people in these countries has more than one mobile phone connections. Worldwide around 5.6 billion mobile connections are in use, which comprise 79.83 per cent of the total population.
USAGE OF MOBILE PHONE IN THE WORLD COUNTRIES

- United States, 105.38%
- India, 75.95%
- China, 76.06%
- Nigeria, 64.70%
- Germany, 130.68%
- Pakistan, 64.08%
- Japan, 95.00%
- Russia, 156.93%
- Indonesia, 105.28%
- Brazil, 132.02%
- United States, 105.38%
- India, 75.95%
- China, 76.06%
- Nigeria, 64.70%
- Germany, 130.68%
- Pakistan, 64.08%
- Japan, 95.00%
- Russia, 156.93%
- Indonesia, 105.28%
- Brazil, 132.02%
Table 2.2

Top Mobile Phone Manufacturers by 2011 Global Sales

<table>
<thead>
<tr>
<th>Rank</th>
<th>Vendor</th>
<th>2011 Shipment (Million)</th>
<th>2011 Market Share (%)</th>
<th>2010 Shipment (Million)</th>
<th>2010 Market Share (%)</th>
<th>Annual Growth (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Nokia</td>
<td>422.4</td>
<td>23.8</td>
<td>461.3</td>
<td>28.9</td>
<td>-8.4</td>
</tr>
<tr>
<td>2</td>
<td>Samsung</td>
<td>313.9</td>
<td>17.7</td>
<td>281.0</td>
<td>17.6</td>
<td>11.7</td>
</tr>
<tr>
<td>3</td>
<td>Apple</td>
<td>89.2</td>
<td>5.0</td>
<td>46.5</td>
<td>2.9</td>
<td>91.8</td>
</tr>
<tr>
<td>4</td>
<td>LG</td>
<td>86.4</td>
<td>4.9</td>
<td>114.1</td>
<td>7.1</td>
<td>-24.3</td>
</tr>
<tr>
<td>5</td>
<td>ZTE</td>
<td>56.9</td>
<td>3.2</td>
<td>29.6</td>
<td>1.9</td>
<td>92.2</td>
</tr>
<tr>
<td>6</td>
<td>RIM</td>
<td>51.5</td>
<td>2.9</td>
<td>49.6</td>
<td>3.1</td>
<td>3.8</td>
</tr>
<tr>
<td>7</td>
<td>HTC</td>
<td>43.2</td>
<td>2.4</td>
<td>24.6</td>
<td>1.5</td>
<td>75.6</td>
</tr>
<tr>
<td>8</td>
<td>Huawei</td>
<td>40.6</td>
<td>2.3</td>
<td>23.8</td>
<td>1.5</td>
<td>70.6</td>
</tr>
<tr>
<td>9</td>
<td>Motorola</td>
<td>40.2</td>
<td>2.3</td>
<td>38.5</td>
<td>2.4</td>
<td>4.4</td>
</tr>
<tr>
<td>10</td>
<td>Sony Ericsson</td>
<td>32.5</td>
<td>1.8</td>
<td>41.8</td>
<td>2.6</td>
<td>-22.2</td>
</tr>
<tr>
<td>11</td>
<td>Others</td>
<td>597.3</td>
<td>33.7</td>
<td>485.4</td>
<td>30.4</td>
<td>23.1</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>1774.1</td>
<td>100.0</td>
<td>1596.2</td>
<td>100.0</td>
<td>11.1</td>
</tr>
</tbody>
</table>

Source: Gartner, February 2012.

According to Table 2.2, Nokia leads the list with manufacturing of 461.3 million handsets in 2010 and 422.4 million sets in 2011 with decline of 8.4 per cent in 2011 compared to 2010. Next to Nokia, Samsung and Apple occupied the list with second and third position experiencing a positive growth rate of 11.7 per cent and 91.8 per cent in 2011 compared to previous year. Overall, all vendors together manufactured 1774.1 million handsets in 2011 compared to 1596.2 million in 2010 with a positive growth rate of 11.1 per cent world over.
2.6 TELECOM INDUSTRY IN INDIA

The Indian telecom sector, like any other industrial sector in the country, has gone through many phases of growth and diversification. Starting from the telegraphic and telephonic systems of the 19th century, communication now involves advanced technologies like GSM, CDMA, WLL and the 3G technology used in mobile phones. Both public and private players are investing continuously in this sector, with the customer being the beneficiary.

The Indian telecom sector can be broadly classified into fixed line telephony and mobile telephony. The major players of the telecom sector are currently experiencing fierce competition in both the segments. Major players like BSNL, MTNL and VSNL in the fixed line sector, and Airtel, Aircel, Vodafone, Idea, Tata and Reliance in the mobile segment, are coming up with new tariffs and discount schemes to gain the competitive advantage. The public and private players share the fixed line and the mobile segments, with the public sector controlling more than 60 per cent of the market.

Both fixed line and mobile segments serve the basic needs of local, long distance and international calls, with the provision of broadband services in the fixed line segment and GPRS in the mobile arena. Traditional telephones have been replaced by the cordless and wireless instruments. Mobile phone providers have also come up with GPRS-enabled multimedia messaging, Internet surfing, and mobile-commerce. The GSM, CDMA and WLL service providers are all upgrading themselves to provide 3G mobile services.

Along with an improvement in telecom services, there is also an improvement in manufacturing. In the beginning, there were only Siemens handsets in India, but now a whole series of new handsets, such as Nokia’s latest N-series, Sony Ericsson’s W-series, Motorola’s PDA phones, etc, are widely available. Touch screen and advanced handsets are gaining popularity. Radio services have also been incorporated into mobile handsets, along with other applications like a large memory, multimedia applications, multimedia games, MP3 players, cameras, etc. The value added services provided by mobile service operators contribute to more than 10 per cent of the total revenue. Given below the list of telecom companies in India - some are State owned, some private & some formed in collaboration with other foreign companies.
2.6.1 Government owned Telecom Companies

**Bharat Sanchar Nigam Ltd (BSNL)** – One of the largest & leading public sector units in India. It was formed in October, 2000, is World’s 7th largest Telecommunications Company providing comprehensive range of telecom services in India. BSNL is the only service provider, making focused efforts and planned initiatives to bridge the Rural-Urban Digital Divide ICT (Information and Communication Technology) sector. Its wide network is present across India except Delhi & Mumbai. BSNL cellular service, Cell One, has 55,140,282 2G cellular customers and 88,493 3G customers as on November 2009. It has 35.1 million Basic Phone subscribers forming 85 per cent share of the subscriber base and 92 percent share in revenue terms. BSNL has more than 2.5 million Internet Customers who access Internet through various modes viz. Dial-up, Leased Line, Direct Internet Access Service (DIAS), Account Less Internet (ALI). BSNL has been adjudged as the NUMBER ONE ISP (Internet Service Provider) in the country.

**Mahanagar Telephone Nigam Ltd (MTNL)** – It is a state-owned telecommunications service provider in the metro cities of Mumbai and New Delhi in India. The company was a monopoly until 1992, when the telecom sector was opened to other service providers. MTNL provides fixed line telephones, cellular connection of both GSM (Global System for Mobile communication) and CDMA (Code Division Multiple Access) and internet services through dialup and DSL (Digital Subscriber Line) — Broadband internet. MTNL also provides other services such as VPN (Virtual Private Network), Internet Telephony - VOIP (Voice over Internet Protocol) and leased lines through BSNL and VSNL (Videsh Sanchar Nigam Limited). MTNL has also unveiled very cost-effective Broadband Internet access plans (Tri-Band) targeted at homes and small businesses. MTNL has suffered even more than BSNL and just about survives in a pathetic condition.

2.6.2 Private Indian owned Companies

**Reliance Communications Limited** – One of the major Indian telecommunication company headquartered in Navi Mumbai, India. It is the 16th largest operator in the world with more than 128 million subscribers. It is India’s largest and only telecom operator offering nationwide CDMA, GSM and 3G mobile services. Anil Dhirubhai Ambani Group, an offshoot of the Reliance Group, ranks among India’s top three private sector
business houses in terms of net worth. The group has business interests that range from telecommunications (Reliance Communications Limited) to financial services (Reliance Capital Ltd) and the generation and distribution of power (Reliance Infrastructure Limited). Reliance Communications (RCOM) was the first Indian company to make handsets so popular in India. It is present in almost the whole of country – Andhra Pradesh, Bihar, Chennai, Delhi, Gujarat, Haryana, Himachal Pradesh, Jammu & Kashmir, Karnataka, Kerala, Kolkata, Madhya Pradesh, Maharashtra, Mumbai, Orissa, Punjab, Rajasthan, Tamilnadu, Uttar Pradesh (E), Uttar Pradesh (W), West Bengal. Reliance Communications paid Rs.5864.29 crores for 3G spectrum in 13 circles. In 2010, RCOM became the second private sector telecom company (fourth overall) to launch 3G services in India, with a 4 city launch in Chandigarh, Delhi, Kolkata and Mumbai.

**TATA Tele-services Limited** – is the pioneer of the CDMA 1x technology platform in India. It has embarked on a growth path since the acquisition of Hughes Tele.com (India) Ltd [renamed Tata Teleservices (Maharashtra) Limited] by the Tata Group in 2002. It launched mobile operations in January 2005 under the brand name **Tata Indicom** and today enjoys a pan-India presence through existing operations in all of India’s 22 telecom Circles – Assam, Andhra Pradesh, Bihar, Chennai, Delhi, Gujarat, Haryana, Himachal Pradesh, J & K, Karnataka, Kerala, Kolkata, Madhya Pradesh, Maharashtra, Mumbai, North East, Orissa, Punjab, Rajasthan, Tamilnadu, Uttar Pradesh (E), Uttar Pradesh (W), West Bengal. The company is also the market leader in the fixed wireless telephony market. It is the first to pioneer the per-second tariff option—part of its ‘Pay for What You Use’ pricing paradigm. Tata Teleservices Limited has also become the first Indian private telecom operator to launch 3G services in India under the brand name Tata DOCOMO, with its recent launch in all the nine telecom Circles where it bagged the 3G license.

**Idea Cellular Ltd.** – Initially a Birla-TATA-AT&T initiative, is now an Aditya Birla Group company. In 2005, AT&T sold its investment in Idea, and the year after Tatas also exited. Idea has its presence in Delhi (Metro), Andhra Pradesh, Gujarat, Haryana, Himachal Pradesh, Maharashtra, Kerala, Madhya Pradesh, Rajasthan, Uttar Pradesh (E), Uttar Pradesh (West). The company is among the top four mobile telephony players in India with an 11 per cent all-India subscribers’ market share. Idea paid
Rs.5768.59 crores for 3G spectrum in 11 circles. Idea enjoys a market leadership position in many of its operational areas. It offers GPRS on all its operating networks for all categories of subscribers, and was the first company in India to commercially launch the next generation EDGE technology in Delhi in 2003.

**Videocon Communications Limited** – A Videocon group company which offers GSM mobile services GSM service. The company started its telecom services after the 2G Auction and operates in Tamilnadu (including Chennai), Punjab, Haryana, Mumbai, Gujarat, Kerala, Madhya Pradesh, UP East, UP West, Himachal Pradesh.

**Quadrant Televentures Limited** – Formerly HFCL Infotel Limited, is a Unified Access Services Licensee in Punjab Telecom Circle. Commonly known by the name Connect, provides voice telephony In March 2010, it launched its GSM services in the Punjab Service Area. In April 2010, it acquired remaining interest in Infotel Tower Infrastructure Private Limited.

### 2.6.3 Private Companies with majority stake by Foreign Investors

**Bharti Airtel Limited** – It is the largest India mobile operator by subscriber base. Commonly known as Airtel, is an Indian telecommunications company that operates in 19 countries across South Asia, Africa and the Channel Islands. Airtel also offers fixed line services and broadband services. Airtel is the largest cellular service provider in India and fifth largest in the world present in Delhi (Metro), Mumbai (Metro), Kolkata (Metro), Chennai (Metro), Andhra Pradesh, Assam, Bihar, Gujarat, Haryana, Himachal Pradesh, Jammu & Kashmir, Kerala, Karnataka, Madhya Pradesh, Maharashtra, North East, Orissa, Punjab, Rajasthan, Tamilnadu, Uttar Pradesh (E), Uttar Pradesh (W), West Bengal. Airtel won 3G spectrum in 13 circles: Delhi, Mumbai, Andhra Pradesh, Karnataka, Tamilnadu, Uttar Pradesh (West), Rajasthan, West Bengal, Himachal Pradesh, Bihar, Assam, North East, Jammu & Kashmir for Rs. 12,295 crores. Bharti Airtel wins broadband spectrum in four circles: Maharashtra, Karnataka, Punjab and Kolkata for Rs. 3314.36 crores. Airtel acquired Zain’s African operations for $10.7 billion to increase its base to more than 180 million globally.

**Vodafone Limited** – The world’s largest mobile telecommunications company measured by revenues and the world’s second-largest measured by subscribers.
It operates networks in over 30 countries and has partner networks in over 40 additional
countries. It owns 45 per cent of Verizon Wireless, the largest mobile telecommunications
compny in the United States measured by subscribers. In India it is present in Andhra
Pradesh, Chennai (Metro), Delhi (Metro), Gujarat, Haryana, Karnataka, Kolkata (Metro),
Mumbai (Metro), Punjab, Rajasthan, Uttar Pradesh (W), Uttar Pradesh (E), West Bengal,
Maharashtra, Tamilnadu, Kerala, Jammu & Kashmir, Himachal Pradesh, Orissa, Bihar,
Assam, North East, Madhya Pradesh. Vodafone entered India by acquiring the
Hutchinson stake.

**Aircel Group** – a joint venture between Maxis Communications of Malaysia and
Apollo Hospitals of India. UTSB has a 74 per cent stake in Aircel and the remaining
26 per cent is with Apollo Hospitals. It is India’s Seventh largest GSM mobile service
provider. It offers both prepaid and postpaid GSM cellular phone coverage throughout
India. As on date, Aircel is present in all 23 telecom circles Assam, Bihar, Chennai,
Himachal Pradesh, Jammu & Kashmir, North East, Orissa, Tamilnadu, West Bengal,
Kolkata, Delhi, Kerala, Karnataka, Andra Pradesh, UP(E), UP(w), Mumbai (COAI).
Aircel has also obtained permission from Department of Telecommunications (DoT) to
provide International Long Distance (ILD) and National Long Distance (NLD) telephony
services. It also has the largest service in Tamilnadu. Aircel paid Rs.6499.46 crores for
the 3G spectrum in 13 circles – the least cost per circle compared to other operators.
The circles it will provide 3G in are Andhra Pradesh, Assam, Bihar, Jammu & Kashmir,
Karnataka, Kerala, Kolkata, Madhya Pradesh, Chhattisgarh, North East, Orissa, Punjab,
Tamilnadu, Uttar Pradesh, Uttarakhand, West Bengal. Aircel paid Rs.3438crores for the
broadband wireless access spectrum in 8 circles, the second highest wins overall – after
Reliance Communications. The circles it has won spectrum are Andhra Pradesh, Assam,
Bihar, Jammu & Kashmir, North East, Orissa, Tamilnadu and West Bengal.

**Loop Mobile Limited** – In the year 2009, BPL Mobile re-branded itself as Loop
Mobile and has been operating since then in Mumbai. BPL Mobile Communications
Limited offers GSM wireless facilities in three states of India besides offering broadband
facilities via wireless BPLNET with an ADSL internet competence. It offers pre and post
paid, data, and roaming services. The company has also started manufacturing handsets.
Spice Communications Limited – Now a subsidiary of Idea Cellular Limited, which owns more than 80% equity in the company. The Aditya Birla Group took over the ownership of Spice Telecom for over Rs.2,700 crore. The company’s areas of operation are Karnataka & Punjab. The prepaid users (which form majority in India) had problems getting their phones recharged with prepaid balance when in roaming. Hence, Spice could not regain the market share in spite of its low tariffs.

S Tel Limited is a joint venture between Siva Group (formerly Sterling Infotech Group) and Bahrain Telecommunications Company (Batelco). S Tel has acquired Unified Access Services Licenses (UASL) and spectrum to operate in six Category C circles – Orissa, Bihar, Himachal Pradesh, North East, Assam and Jammu & Kashmir. These licenses will enable the company to provide Unified Mobile service, wireless broadband and other innovative Value Added Services.

Unitech Wireless Ltd. – Unitech Group (32.75%) in joint venture with Norway’s telecom major Telenor (67.25%) had started its service in telecom business under the name of Uninor. It offers mobile telephony services in India. The company was incorporated in 2008 and is based in Gurgaon, India. The company holds a pan-India UAS licence to offer telecommunications services in each of India’s 22 circles & has also received spectrum for six circles. Unitech has sold out a majority stake in its telecom arm, making Unitech Wireless one of the few telecom companies controlled by foreign telephone companies. The company benefited the most in the 2G spectrum allocation scam. Its promoters gained Rs.2,342 crore and now the company is under direct investigation by the Supreme Court over corruption charges.

Etisalat DB Telecom Private Limited – is a joint venture between Etisalat and Dynamix Balwas Group. Another telecom company which has now come under the Supreme Court Scanner with Balwa in jail. In 2009 he Board of Etisalat DB, today announced the ‘change of name’ of the erstwhile Swan Telecom, a joint venture between Etisalat and DB Realty. The company has officially been re-named as Etisalat DB Telecom India Pvt. Ltd. Etisalat DB and its subsidiary has the Unified Services Access License in 15 circles including Andhra Pradesh, Delhi, Gujarat, Haryana, Karnataka, Kerala, Maharashtra, Mumbai, Punjab, Rajasthan, Tamilnadu (including Chennai), Uttar Pradesh (East), Uttar Pradesh (West), Madhya Pradesh and Bihar.
**Sistema Shyam teleservices (SSTL)** – Mobile Tele Systems OJSC (“MTS”) is the leading telecommunications group in Russia, Eastern Europe and Central Asia, offering mobile and fixed voice, broadband, pay TV as well as content and entertainment services. In December 2008, MTS extended its brand outside the CIS borders. MTS and Shyam Telelink Limited, JSFC Sistema’s telecommunications subsidiary in India, announced the agreement to allow Shyam Telelink to use MTS brand in India. In 2008, Vodafone announced a partnership deal with MTS, whereby Vodafone services will be available to MTS subscribers and both companies have noted the potential for more efficient purchasing. MTS's present in Andhra Pradesh, Kerala, Rajasthan, Tamilnadu (including Chennai), Kolkatta, West Bengal, Bihar, Delhi, Mumbai, Haryana, Maharashtra, UP (E), UP (W), Madhya Pradesh, Gujarat, Punjab (AUSPI). MTS has been listed on the New York Stock Exchange since July 2000 and trades under the ticker MBT. The Company’s shares have been listed locally on Moscow Inter-bank Currency Exchange (MICEX) since November 2003.

**2.7 CELLULAR MOBILE SERVICE IN INDIA**

In the last ten years, the mobile revolution has truly changed the socio-economic landscape of India and played a pivotal role in the growth and development of the economy. According to Cellular Operator Association of India (COAI), India ranks between the top ten telecom network in the world and the second largest in Asia. India is also one of the fastest growing markets in mobile communications. Telecom Regulatory Authority of India’s report on Telecom Services Performance (TRAI, 2010) indicates cellular mobile subscriber base touching 635.71 million in June 2010. Growth in India’s mobile telephone sector has been nothing short of spectacular in the past few years, aided by higher subscriber volumes, lower tariffs and falling handset prices. India is home to a number of global mobile operators working with local companies and mobile market has consistently experienced very high annual growth rates with the continuous decline in tariff.

The mobile sector subscribers in India have grown from around 10 million subscribers in the year 2002 to 250.93 million by the end of February 2008. According to Telecom Regulatory Authority of India (TRAI), a total of 8.49 million telephone connections were added during February 2008. The annual growth of mobile cellular
services recorded in India during the last few years has been nearly 100 percent, but still, after over a decade of start of mobile services in the country, only 30 percent of the 600 million addressable markets of mobile users in the country of over one billion people have been reached. Today, around eight million new telephone subscribers are being added in India every month. This is mostly in the mobile telephone segment.

The telecommunication sector, especially the mobile phone sector, in India is one of the fastest growing business segments of the country which provide a lot of value addition to the society with its service and creation of employment opportunities. Along with the normal services all the operators are now offer internet facilities which enable the subscribers to reach the whole world through internet easily and their services includes prepaid, post-paid, internet, value added services, roaming and devices. The area of operation-wise mobile phone service providers in India is listed in Table 2.3.

**Table 2.3**

**Mobile Phone (GSM & CDMA) Service Providers and Area of Operation**

*(As on September 2011)*

<table>
<thead>
<tr>
<th>S.No</th>
<th>Service Provider</th>
<th>Area of Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bharti Airtel</td>
<td>All India</td>
</tr>
<tr>
<td>2</td>
<td>Aircel Group</td>
<td>All India</td>
</tr>
<tr>
<td>3</td>
<td>Reliance COM</td>
<td>All India (Except Assam &amp; North East - NE)</td>
</tr>
<tr>
<td>4</td>
<td>Reliance Telecom</td>
<td>Kolkatta, MP, WB, HP, Bihar, Odissa, Assam &amp; NE</td>
</tr>
<tr>
<td>5</td>
<td>Vodafone</td>
<td>All India</td>
</tr>
<tr>
<td>6</td>
<td>Tata Teleservices</td>
<td>All India</td>
</tr>
<tr>
<td>7</td>
<td>IDEA (incl.SPICE)</td>
<td>All India</td>
</tr>
<tr>
<td>8</td>
<td>Sistema Shyam</td>
<td>All India</td>
</tr>
<tr>
<td>9</td>
<td>BSNL</td>
<td>All India (Except Delhi &amp; Mumbai)</td>
</tr>
<tr>
<td>S.No</td>
<td>Service Provider</td>
<td>Area of Operation</td>
</tr>
<tr>
<td>------</td>
<td>-----------------------</td>
<td>----------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>10</td>
<td>MTNL</td>
<td>Delhi &amp; Mumbai</td>
</tr>
<tr>
<td>11</td>
<td>Loop Telecom</td>
<td>Mumbai, Kolkata, Punjab, Haryana, Rajasthan, MP, Odissa, Assam, NE, MH, Bihar &amp; Gujarat</td>
</tr>
<tr>
<td>12</td>
<td>Quadrant (HFCL)</td>
<td>Punjab</td>
</tr>
<tr>
<td>13</td>
<td>Unitech</td>
<td>AP, Karnataka, TN (incl. Chennai), Kerala, UP(W), UP(E), Bihar, Orissa, Mumbai, Kolkata, MH, Gujarat, WB, Punjab &amp; MP</td>
</tr>
<tr>
<td>14</td>
<td>S Tel</td>
<td>Assam, NE, HP, Bihar &amp; Odissa</td>
</tr>
<tr>
<td>15</td>
<td>Videocon</td>
<td>Haryana, TN (incl Chennai), Mumbai, Gujarat, Kerala, MH, AP, Karnataka, UP(W), UP(E), Rajasthan, MP, WB, HP, Bihar &amp; Odissa</td>
</tr>
<tr>
<td>16</td>
<td>Etisalat / Alliance</td>
<td>AP, Delhi, Gujarat, Karnataka, Kerala, Maharashtra, Punjab, Rajasthan, UP(E), Mumbai, TN (incl Chennai), Haryana, UP(W), MP &amp; Bihar</td>
</tr>
</tbody>
</table>

Source: TRAI, The Indian Telecom Services Performance Indicators, July – September 2011, Website: www.trai.gov.in.

Table 2.4

Top 15 Mobile Phone Service Providers by Subscriber Base in India
(As on December 2011)

<table>
<thead>
<tr>
<th>S. No</th>
<th>Mobile Phone Service Provider</th>
<th>Number of Subscribers</th>
<th>Market Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bharti Airtel</td>
<td>14,62,93,078</td>
<td>20.70</td>
</tr>
<tr>
<td>2</td>
<td>Reliance Communication</td>
<td>11,93,51,438</td>
<td>16.89</td>
</tr>
<tr>
<td>3</td>
<td>Vodafone</td>
<td>11,80,38,438</td>
<td>16.70</td>
</tr>
<tr>
<td>4</td>
<td>Tata Teleservices</td>
<td>8,08,17,298</td>
<td>11.44</td>
</tr>
<tr>
<td>5</td>
<td>BSNL</td>
<td>8,07,39,935</td>
<td>11.43</td>
</tr>
<tr>
<td>S. No</td>
<td>Mobile Phone Service Provider</td>
<td>Number of Subscribers</td>
<td>Market Share</td>
</tr>
<tr>
<td>-------</td>
<td>-------------------------------</td>
<td>-----------------------</td>
<td>--------------</td>
</tr>
<tr>
<td>6</td>
<td>Idea</td>
<td>7,60,23,551</td>
<td>10.76</td>
</tr>
<tr>
<td>7</td>
<td>Aircel</td>
<td>4,75,19,629</td>
<td>6.72</td>
</tr>
<tr>
<td>8</td>
<td>Unitech</td>
<td>1,37,48,300</td>
<td>1.95</td>
</tr>
<tr>
<td>9</td>
<td>Loop</td>
<td>30,09,445</td>
<td>0.43</td>
</tr>
<tr>
<td>10</td>
<td>Sistema</td>
<td>71,21,765</td>
<td>1.01</td>
</tr>
<tr>
<td>11</td>
<td>MTNL</td>
<td>53,42,039</td>
<td>0.76</td>
</tr>
<tr>
<td>12</td>
<td>Videocon</td>
<td>56,16,152</td>
<td>0.78</td>
</tr>
<tr>
<td>13</td>
<td>Stel</td>
<td>18,67,060</td>
<td>0.26</td>
</tr>
<tr>
<td>14</td>
<td>HFCLInfotel</td>
<td>11,32,477</td>
<td>0.16</td>
</tr>
<tr>
<td>15</td>
<td>Etisalat</td>
<td>70,829</td>
<td>0.01</td>
</tr>
<tr>
<td></td>
<td>All India</td>
<td>70,66,91,434</td>
<td>100.00</td>
</tr>
</tbody>
</table>

Source: http://nxwiki.blogspot.in/2011/02/top-10-mobile-service-providers-in.html

Among the Top 15 mobile phone services providers in India, Bharti Airtel stands first with of 20.7 per cent of the total subscribers in India (Table 2.4). The Reliance communication, Vodafone, Tata Teleservices, BSNL and Idea cellular services follows the Bharti Airtel with market share of 16.89 per cent, 16.70 per cent, 11.44 per cent, 11.43 per cent and 10.76 per cent respectively. By state-wise mobile phone subscribers, it is understood that Uttar Pradesh comes first of 928 million subscriber base followed by Maharashtra and Tamilnadu (Table 2.5).
Mobile Phone Service Providers by Subscriber Base in India

- Bharti Airtel: 146,293,078
- Reliance Communication: 119,351,438
- Vodafone: 118,038,438
- Trai TeleServices: 80,817,298
- BSNL: 80,739,935
- Idea: 7,602,355
- Aircel: 4,751,9629
- Unitech: 1,374,8830
- Loop: 309,445
- Sistema: 712,1765
- MTNL: 53,42,039
- Videocon: 56,16,152
- Sterlite: 18,67,060
- LoopInfotel: 11,32,477
- Etisalat: 70,829

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**Table 2.5**

**State-wise Mobile Phone Subscribers**

(As on December 2011)

<table>
<thead>
<tr>
<th>S. No</th>
<th>State</th>
<th>Number of Subscribers</th>
<th>Population</th>
<th>Per 1000 Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Uttar Pradesh</td>
<td>9,28,67,835</td>
<td>19,94,15,992</td>
<td>466</td>
</tr>
<tr>
<td>2</td>
<td>Maharashtra</td>
<td>8,45,43,727</td>
<td>11,03,51,688</td>
<td>766</td>
</tr>
<tr>
<td>3</td>
<td>Tamilnadu</td>
<td>6,36,71,528</td>
<td>6,77,73,611</td>
<td>939</td>
</tr>
<tr>
<td>4</td>
<td>Andhra Pradesh</td>
<td>5,40,00,379</td>
<td>8,42,41,069</td>
<td>641</td>
</tr>
<tr>
<td>5</td>
<td>West Bengal</td>
<td>5,19,01,967</td>
<td>9,05,24,849</td>
<td>573</td>
</tr>
<tr>
<td>6</td>
<td>Bihar</td>
<td>4,63,11,291</td>
<td>9,75,60,027</td>
<td>475</td>
</tr>
<tr>
<td>7</td>
<td>Karnataka</td>
<td>4,38,02,688</td>
<td>5,89,69,294</td>
<td>743</td>
</tr>
<tr>
<td>8</td>
<td>Gujarat</td>
<td>4,01,58,662</td>
<td>5,83,88,625</td>
<td>688</td>
</tr>
<tr>
<td>9</td>
<td>Rajasthan</td>
<td>3,86,49,784</td>
<td>6,74,49,102</td>
<td>573</td>
</tr>
</tbody>
</table>

Source: [http://nxwiki.blogspot.in/2011/02/top-10-mobile-service-providers-in.html](http://nxwiki.blogspot.in/2011/02/top-10-mobile-service-providers-in.html)

But from the subscribers per 1000 population, Tamilnadu stands first with 939 subscribers followed by Maharashtra, Karnataka and Gujarat with 766, 743 and 688 subscribers per 1000 population.
Table 2.6
Leading Mobile Phone Service Providers by Subscriber Base in Tamilnadu
(As on March 2012)

<table>
<thead>
<tr>
<th>S.No</th>
<th>Mobile Phone Service Provider</th>
<th>Number of Subscribers</th>
<th>Market Share</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Aircel Ltd</td>
<td>1,80,92,626</td>
<td>27.93</td>
</tr>
<tr>
<td>2</td>
<td>Vodafone</td>
<td>1,00,99,741</td>
<td>15.59</td>
</tr>
<tr>
<td>3</td>
<td>Airtel</td>
<td>1,00,63,541</td>
<td>15.53</td>
</tr>
<tr>
<td>4</td>
<td>BSNL</td>
<td>76,30,368</td>
<td>11.78</td>
</tr>
<tr>
<td>5</td>
<td>Reliance</td>
<td>74,98,037</td>
<td>11.57</td>
</tr>
<tr>
<td>6</td>
<td>Tata</td>
<td>33,96,010</td>
<td>5.24</td>
</tr>
<tr>
<td>7</td>
<td>Uninor</td>
<td>21,43,260</td>
<td>3.31</td>
</tr>
<tr>
<td>8</td>
<td>IDEA</td>
<td>21,20,156</td>
<td>3.27</td>
</tr>
<tr>
<td>9</td>
<td>MTS</td>
<td>17,28,581</td>
<td>2.67</td>
</tr>
<tr>
<td>10</td>
<td>Videocon</td>
<td>12,76,541</td>
<td>1.97</td>
</tr>
<tr>
<td>11</td>
<td>Etisalat</td>
<td>31,915</td>
<td>0.05</td>
</tr>
<tr>
<td>12</td>
<td>Others</td>
<td>6,99,477</td>
<td>1.08</td>
</tr>
<tr>
<td></td>
<td>All Tamilnadu</td>
<td>6,47,80,253</td>
<td>100.00</td>
</tr>
</tbody>
</table>

Source: Cellular Operators Association of India (COA), [http://www.india-cellular.com/31-3-12.htm](http://www.india-cellular.com/31-3-12.htm).

In Tamilnadu, Aircel Ltd dominates by subscriber base holding 27.93 per cent of the total connections (Table 2.6). Next to Aircel, Vodafone, Airtel, BSNL and Reliance holds second, third, fourth and fifth place with market share of 15.59 per cent, 15.53 per cent, 11.78 per cent and 11.57 per cent respectively.
Leading Mobile Phone Service Providers by Subscriber Base in Tamil Nadu

- Aircel Ltd: 1,80,92,626
- Vodafone: 1,00,99,741
- Airtel: 1,00,63,541
- BSNL: 76,30,368
- Reliance: 74,98,037
- Tata: 33,96,010
- Uninor: 21,43,260
- IDEA: 21,20,156
- MTS: 17,28,581
- Videocon: 12,76,541
- Etisalat: 31,915
- Others: 6,99,477

Service Provider

No. of Subscribers
2.8 REGULATORY FRAMEWORK

The Indian telecom industry has been one of the best performing industry groups in the recent years. In order to facilitate the sector several reforms have been introduced in the sector during the past decade. The National Telecom Policy of 1994 and the New Telecom Policy of 1999 (NTP-99) has been the driving force of the development and liberalisation in this sector. Since its inception, Department of Telecommunication (DoT) is formulating developmental policies for driving the growth of the telecom sector.

2.8.1 Pre-Liberalisation Scenario

In the 1880s telephone services were merged with the postal system and the telecom services came under the monopoly of the Department of Post and Telegraph. The Indian telecom sector was entirely under government ownership till the 1980s. In 1984, the private sector was allowed only in telecommunication equipment manufacturing. As a part of the early reforms, the government set up an autonomous body, the Centre for Development of Telematics (C-DOT) in 1984, to develop the R&D activity in the telecom sector. It was set up to develop the state-of-the-art telecommunication technology to meet the needs of the Indian telecommunication network.

The government separated the Department of Post and Telegraph in 1985 by setting up the Department of Post and the Department of Telecommunication (DoT). The DoT was established as a wholly-owned government operator for the entire telecom service operation in India. The responsibility for managing the planning, engineering, installation, maintenance, management, and operations of telecom services lay with the DoT.

In order to ease out DoT operations, the government set up two new public sector corporations, MTNL and VSNL, under the DoT in 1986, however, the government retained policy formulation and regulation decisions with the DoT. While MTNL was established to look after the operation of basic telephony services in metros such as Mumbai and New Delhi, VSNL was set up to operate, develop and accelerate international telecom services in India. The Telecom Commission was set up in 1989 as an executive body to assist the DoT in policy regulation, licensing, wireless spectrum management, administrative monitoring of PSUs, research and development and standardisation/validation of equipment etc.
2.8.2 Liberalisation Policy 1991

In 1991, India adopted the new economic policy of liberalisation. The policy aimed at improving viability, competitiveness and efficiency of the Indian economy in the international market and also for enhancement and growth of international trade. To attain the objectives of new economic policy a telecom service of world class quality was essential. Thus thrust in reforms in the telecommunication sector was witnessed during the 1990s along with the liberalisation of the economy. Liberalisation in telecommunication services began in 1992 when the telecom sector was deregulated with the Government unbundling the domestic basic services and the domestic value-added services (VAS)² and allowing private sector participation in provision of value added system (VAS) such as cellular and paging services. The government paved the path for the entry of the private sector in telephone services by adopting the National Telecom Policy in 1994. This policy aimed at bringing about universal service and qualitative improvement in telecom services.

2.8.3 National Telecom Policy 1994 (NTP-94)

The National Telecom Policy was announced in 1994 which aimed at improving India's competitiveness in the global market and provides a base for a rapid growth in exports. This policy eventually facilitated the emergence of Internet services in India on the back of established basic telephony communication network. This policy also paved way for the entry of the private sector in telephone services.

The main objectives of the policy were:

- To ensure telecommunication is within the reach of all, that is, to ensure availability of telephone on demand as early as possible
- To achieve universal service covering all villages, that is, enable all people to access certain basic telecom services at affordable and reasonable prices

² Telecom services were categorized into domestic basic (which included basic telephony, telex and fax), domestic value-added services (VAS) which covered all other services such as paging, cellular, data services, VSAT and international basic and VAS
• To ensure world-class telecom services. Remove consumer complaints, resolve disputes and encourage public interface and provide a wide permissible range of services to meet the demand at reasonable prices

• To ensure that India emerges as a major manufacturing base and major exporter of telecom equipment

• To protect the defence and security interests of the nation.

The policy also announced a series of specific targets to be achieved by 1997 and further recognised that to achieve these targets the private sector association and investment would be required to bridge the resource gap. Thus, to meet the telecom needs of the nation and to achieve international comparable standards, the sector for manufacture of telecom equipment had been progressively re-licensed and the sub-sector for value-added services was opened up to private investment (July 1992) for electronic mail, voice mail, data services, audio text services, video text services, video conferencing, radio paging and cellular mobile telephone. The private sector participation in the sector was carried out in a phased manner. Initially the private sector was allowed in the value added services, and thereafter, it was allowed in the fixed telephone services. Subsequently, VSAT services were liberalised for private sector participation to provide data services to closed user groups.

2.8.4 Establishment of TRAI

The entry of private players necessitated independent regulation in the sector; therefore, the TRAI was established in 1997 to regulate telecom services, for fixation/revision of tariffs, and also to fulfil the commitments made when India joined the World Trade Organisation (WTO) in 1995. The establishment of TRAI was a positive step as it separated the regulatory function from policy-making and operation, which continued to be under the purview of the DoT2.

The functions allotted to the TRAI included:

• To recommend the need and timing for introduction of new service provider

• To protect the interest of customers of telecom services
• To settle disputes between service providers

• To recommend the terms and conditions of license to a service provider

• To render advice to the Central government on matters relating to the development of telecommunication technology and any other matter applicable to the telecommunication industry in general.

2.8.5 New Telecom Policy 1999 (NTP-99)

In reorganisation of the fact that the entry of the private sector, which was envisaged during NTP-94, was not satisfactory and in response to the concerns of the private operators and investors about the viability of their business due to non realisation of targeted revenues the government decided to come up with a new telecom policy. Moreover, convergence of both markets and technologies required realignment of the industry. To achieve India’s vision of becoming an IT superpower along with developing a world class telecom infrastructure in the country, there was a need to develop a new telecom policy framework.

Accordingly, the NTP 1999 was framed with the following objectives and targets:

• Availability of affordable and effective communication for citizens was at the core of the vision and goal of the new telecom policy

• Provide a balance between provision of universal service to all uncovered areas, including rural areas, and the provision of high-level services capable of meeting the needs of the economy

• Encourage development of telecommunication facilities in remote, hilly and tribal areas of the nation

• To facilitate India’s journey to becoming an IT superpower by creating a modern and efficient telecommunication infrastructure taking into account the convergence of IT, media, telecom and consumer electronics

• Convert PCOs, wherever justified, into public telephone information centres having multimedia capability such as ISDN services, remote database access, government and community information systems etc
• To bring about a competitive environment in both urban and rural areas by providing equal opportunities and level playing field for all players
• Providing a thrust to build world-class manufacturing capabilities and also strengthen research and development efforts in the country
• Achieve efficiency and transparency in spectrum management
• Protect the defence and security interests of the country
• Enable Indian telecom companies to become global players.

2.8.6 Developments After 2000

There were major developments on the policy front post year 2000. Establishment of Bharat Sanchar Nigam Ltd (BSNL) (2000), privatisation of VSNL (2002), termination of monopoly of VSNL in International Long Distance, opening up of National Long Distance (NLD) and International Long Distance (ILD) services to competition (2000), introduction of Unified Access Licensing (UASL) regime (2003), implementation of calling party pays (CPP) (2003), increase in FDI limits from 49% to 74% (2005) and proposal for mobile number portability (2006) which paved way for the remarkable growth in the sector.

2.8.7 Universal Access Regime

In 2001, basic service operators in India were permitted to offer limited mobility services over wireless local loop (WLL (M)) using CDMA technology in their coverage areas. Moreover, they were also able to offer all-India mobility using the CDMA WLL (M) technology. The regime resulted in increasing the popularity of these services, as the prices of these services were generally lower than that for GSM cellular mobile services. This created a potential disadvantage for the GSM cellular operators as they had paid substantial amounts to obtain their licences and WLL (M) services were increasingly seen as largely substitutable for GSM services; as a result, the government decided to move towards a Unified Access Services Licensing regime for basic and cellular services, which was introduced in October 2003. The focus of the effort was on technological advancement. Under the new licensing regime, both basic service operators and cellular carriers gained freedom to offer basic and/or cellular mobile services using any technology, which has ensured a fair competitive market for the service providers.
2.8.8 Interconnection Usage Charges Regime (2003)

Interconnection is very important for the service providers and users. A variety of access networks - fixed and mobile, national long distance network and international long distance networks have to interconnect with each other to make local, national and international calls possible. In order to have seamless end-to-end service, it is imperative to have an effective interconnection usage charges (IUC) regime in place.

The TRAI implemented the Telecommunication Interconnection Usage Charges (IUC) Regulation during 2003 to fix the terms and conditions of interconnectivity between service providers, to ensure effective interconnection between different service providers and to regulate arrangements among service providers for sharing their revenue derived from providing telecommunication services.

2.8.9 Broadband Policy (2004)

TRAI constantly monitors growth of internet services in India. In December 2003, penetration of broadband and internet services in India was very low at 0.02 per cent and 0.4 per cent\(^3\), respectively; as a result, the government announced the Broadband Policy on 2004 on the basis of TRAI recommendations to facilitate greater levels of penetration. The Broadband Policy Framework virtualised creation of infrastructure through various access technologies, which could contribute to growth and could coexist.

It also aimed at creation of an environment for promoting knowledge-based society. It was also realised that improving broadband connectivity would bring about major implications such as creation of e-governance, online education, telemedicine networks and connectivity for rural knowledge centres, greater integration into the world economy through international voice and videoconferencing, lower prices for NLD and ILD etc.

Moreover, the Ministry of Information and Technology has proposed establishing a National Knowledge Network to inter-connect all knowledge institutions through an electronic digital broadband network. The new broadband policy encouraged creation and growth of infrastructure through various access technologies that can mutually coexist such as optical fibre technologies, digital subscriber lines on copper loop, cable TV network,

\(^3\) As per Economic Survey, 2004-05.
satellite, and terrestrial wireless technologies. The telecom regulator also suggested a range of measures for an open-sky policy for DTH, VSAT4 and uplinking, using satellites that could boost broadband.

2.8.10 Foreign Direct Investment (FDI)

One of the important sources of the substantial financial investment required for the growth of tele-density has been FDI. In 2005, the government permitted 74 per cent foreign investment in telecom companies from the earlier limit of 49 per cent which resulted in unprecedented entry of foreign investment in the sector.

2.8.11 Mobile Number Portability

Mobile Number Portability (MNP) will enable subscribers to change their operators while retaining their number; this will not only give more choice to customers but also lead operators to further improve their services to retain their customers. The DOT issued guidelines for MNP service license on August 1, 2008. The DoT has envisaged guidelines for geographical division of the country into two Number Portability Zones (zone 1 and zone 2), each consisting of 11 licensed service areas. According to these guidelines, the MNP will be initially implemented in all metros and category A service areas within 6 months of award of MNP license. Subsequently, the operation of MNP will be expanded to the rest of the service areas in a time-bound manner.

Considering the implementation of MNP service for mobile subscribers, among various mobile service providers in the same service area, requires customisation and upgradation of the existing networks to be capable of proving this service besides considerable time and effort. The DoT had initially decided to launch MNP by the fourth quarter of 2008, however, the implementation of MNP is now extended up to Mar 31, 2010. This will be implemented in the first phase for metro and Category A service areas in Delhi, Mumbai, Kolkata, Maharashtra, Gujarat, Andhra Pradesh and Tamilnadu, including Chennai and Karnataka service areas.

2.8.12 Mobile Virtual Network Operator (MVNO) Policy

India is yet to implement a policy on the MVNO. According to TRAI recommendations to DoT an “MVNO is a licensee in any service area that does not have
spectrum of its own for access service, but can provide wireless (mobile) access services to its own customers through an agreement with the licensed access provider, UAS/CMTS licensee. MVNOs are envisaged to work as a catalyst for the growth of the mobile sector. The introduction of MVNOs will help the mobile network operators to widen and deepen the market besides promoting competition. However, the concerned authorities will also consider that since MNP will also be introduced in the near term, introduction of MVNOs will not create bottlenecks in the implementation of MNP.

2.8.13 Spectrum Policy

With growing demand for telecommunication services and the proliferation of new technologies, demand for additional spectrum has been increasing. Spectrum is the most essential input for the growth of wireless services; its inadequacy not only hinders the growth but also adversely affects quality of services. In India, spectrum is shared among Defence, Railways, ONGC, etc and the two streams of Cellular Mobile Service Providers, that is, GSM and CDMA. Another technology, namely, Digital Enhanced Cordless Telecommunications (Cor-DECT) also shares spectrum, but as its reach is less, it is basically not substitutable for GSM and CDMA technologies.

Recognising the importance of spectrum in the growth of wireless services, the Indian government has set up two committees - Spectrum Management Committee 1999 and a Steering Group on Spectrum Pricing 1999. The TRAI also issued recommendations on spectrum-related issues in May 2005. Even the Twenty-eighth Report of the Standing Committee of the Parliament on Spectrum Management 2005 has highlighted issues regarding spectrum management. Assignment of Spectrum in India is governed by the National Frequency Allocation Plan (NFAP) 2002 and the international radio regulations of the International Telecommunications Union (ITU).

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2.8.14 Next Generation Network Recommendations (NGN)

The key aspects of the Next Generation Networks (NGN) are that these networks enable access through a variety of networks, and because they are based on internet protocol (IP) technology, they not only offer much cheaper bandwidth but also make available a wide variety of services. In March 2005, TRAI gave its recommendations on NGN; the main thrust was to bring out the urgent need for unified licensing regime to enable the NGN network to be utilised to their full capabilities and the promotion of broadband in the country. The emphasis was also given on the need for awareness building about the several aspects of NGN.

2.9 CONCLUSION

In this chapter, emergence of mobile phones in the World and in India is overviewed and the technological development of mobile phones in India is discussed. The leading mobile phone services providers by subscriber base at all India and Tamilnadu levels are brought forth. From the subscriber base, it becomes evident that Bharti Airtel, Reliance Communication, Vodafone, BSNL, Tata Teleservices, IDEA, Aircel, Unitech (Uninor), Loop and Sistema are the first 10 service providers by subscriber base at all India level. However, Aircel, Vodafone, Airtel, BSNL, Reliance, Tata, Uninor, IDEA, MTS and Videocon are the first top 10 service providers by subscriber base in Tamilnadu. Finally, regulatory frameworks of India for Telecom industry over the decades are also discussed in detail in this chapter.

\textsuperscript{4} The National Frequency Allocation Plan (NFAP) was developed way back in 1981 on the basis of the international frequency allocations and after taking the national spectrum requirements into account as well as technologies available during that time. Pursuant to the New Telecom Policy 1999 (NTP 1999), the NFAP was reviewed in a transparent manner with participation of all stakeholders and a revised NFAP was formulated known as NFAP 2000. Further, the NFAP 2000 was reviewed in view of changes in the International Radio Regulations and after taking into account the fast-growing national spectrum requirements in a transparent manner and the NFAP 2002 was also published. The NFAP /has been reviewed from time to time, taking into account changes in international allocations as well as national spectrum requirements and emerging technologies.

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