CHAPTER – 1

GROWTH AND DEVELOPMENT OF TELECOMMUNICATION INDUSTRY IN INDIA
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Telecommunication is now universally recognized as one of the prime movers of the modern economy. Hence it is of vital importance for a developing country like India. Indian telecom industry continued to register significant growth in 2008 – 09. Indian telecom network with about 414 million connections in February 2009, is the third largest in the world and the second largest among the emerging economies of Asia\textsuperscript{1} even by March 2007. It is credited with the second largest wireless network in the World. The target of 500 million connections by 2010 has far exceeded by 653.92 million connections. Out of this, wireless subscription reached 617.53 million and wire line subscription declines to 36.39 million. Overall tele density also has reached 55.38 million. Broadband subscription also reached 9.24 million subscribers. The Government of India has reiterated its commitment to reach out to the remote and uncovered areas and to augment the broadband facilities in rural areas.

Telecommunication sector today is undergoing rapid and relentless change marked with shrinking of the distance and minimising the time. The geography of the world is re-defined with the advent of sophisticated technology, which enables the telecommunication services delivery in real time. The sector is experiencing drastic changes enabling the corporate purchaser and the

\textsuperscript{1} Economic Survey of India, 2008 – 09, Publication of Planning Commission, Government of India, Ministry of Finance, p. 245.
common man to enjoy the fruits of reform process in the sector. The perennial development of the telecommunication sector, more particularly in the last decade of the last century, both horizontally and vertically has carved out sustained interest for all the stakeholders to probe and investigate with inquisitiveness of the covert and overt happenings as 'utilitarian phenomenon'.

The telecommunication is the crucial change agent of the twenty-first century. In the knowledge era of today, telecommunication is the catalyst to advent Info-tech society heralding a deluge of change resulting in the way of living of people in the society beyond all imaginations. It is an inevitable industry touching all the people at all the times in the flow of their lives. The advancement of technology in telecommunication has reduced the gigantic world into a global village. Such is the vibrancy and the potentiality of telecommunications.

For the past few years, the technology has advanced with gathering processing and distribution of information. It has led to enrichment of worldwide telecommunications, radio, television and launching of communication satellites.

The economy is growing due to rapid technological process where the need for communicating each other has become a necessity. Organizations with hundreds of offices spread over wide geographical area routinely expect to gather information at their remote output at the push of the button. This realization resulted in sophisticated way

2. Press Release of TRAI, June 28, 2010
of communication that has led to development of mobile and telecommunication industry.

There is no doubt about the dynamic nature of telecommunication sector within the global economy. There is a vide recognition now that telecommunication is a strategic economic sector, in terms of being both a tradable service in its own right and the infrastructure via which other goods and services are traded (in the age of electronic commerce i.e., e-commerce) and delivered. The telecommunication industry is undergoing a fundamental change in the structure world over from that of monopoly to competition.

In the 21st century, there are four main trends that are shaping the world of telecommunications, media and entertainment. These trends are digitalization, convergence, fragmenting audiences, and the growth of internet. Today the communication has been modernized, from the telegraphic communication to the pocket sized mobile communication. The communication plays very crucial role to connect the people from different places within seconds at any time, at any place in the world. In this 21st century, mobile communication has revolutionized the mode of communication and changed the life style of the people. All most all the business people are using mobile communication for their business transactions. It also helps the companies to advertise their products and services through mobile phones with less time and reaching more people at lesser cost. It helps not only the business, but also covers all other human, social activities which take place. Hence the lives of the present generation in the
world are mainly dependent on communication to survive and grow in the present competitive world.

However most of the populations of developing countries like India live in rural areas and often isolated areas. Access to information and telecommunication is essential for development of such areas. It is believed that people in rural areas are generally poor and only a few people can afford fixed telecommunication services, which reduce the number of potential consumers. The new wire less technologies have come to extend better advance cost-effective solutions.

Therefore, many developing countries are now in the process of developing polices to improve telecom penetration in rural areas. In this move many private entrepreneurs are invited to operate and compete with public sector in a much relaxed policies platform.

In the earlier days, government alone operated the telecommunication sector, but as the economy has its growth with more population and companies coming, the need for communicating mobile has gathered importance. This has led to liberalization and privatization of economy where new companies emerged in the mobile industry. In this whole process, companies like Airtel, Spice, Hutch and Reliance have taken birth.

These companies have entered into the market providing different types of services. In order to give good and accurate communication network companies ought to work with the help of satellite networks. At present, there are two types of satellite networks
namely, Global System for Mobile Communication (GSM) and Code Division Multiple Access (CDMA).

Overview of Indian Telecom Industry

Telecommunication is a vital infrastructure industry, having special relevance for a developing country such as India. International studies have estimated that every one per cent increase in tele-density (number of telephones per hundred person) contribute to GDP growth of three per cent – a testimony to the importance of telecommunications as a prime mover of growth. The overall tele density reached 55.38 per hundred persons by May 2010.

The Indian telecom industry has evolved as one of the fastest-growing sectors in the country. Currently, India’s telephone network is one of the largest communications network in the world. India is the third-largest country in the world in terms of telecom subscriber base, with 205.86 million subscribers as on March 2007, up from the earlier eleventh position in 2001; at the end of December 2006 total world telecom subscriber base was around 3,921.0 million. The largest subscriber base is in China (828.84 million), followed by the US at 405.03 million.
The above figure shows that, the sector contributes more than 2.83 per cent of the country’s GDP. Total revenue of the telecom sector during Financial Year 2007 was estimated at Rs 1053.19 billion, up by 21.4 per cent over the previous year (see Fig. 1.1). In financial year 2007, the revenue share of private sector companies was 57 per cent as compared with 48 per cent in FY06; while public sector companies’ revenue share declined from 52 per cent in FY 06 to 43 per cent in FY 07. When compared to 2001 India’s subscriber base has improved from 11th position to 3rd position in 2007 at the end of December 2006 total world telecom subscriber base was around 3,921.0 million. The largest subscriber base is in China (828.84 million), followed by the U.S at 405.03 million.

**Telecom Segments**

Telecommunication services include wire line and wireless services. Wire line services include the basic service, that is, fixed
line. The wireless services include the mobile, WLL (F) and WLL (M). The fixed wire line market share is dominated by the state operators, BSNL and MTNL, who together accounts for around 92 per cent of the total subscriber base. Private sector services are presently available in selective urban areas, and collectively account for remaining 8 per cent of the subscriptions. However, private services focus on the business/corporate sector, and offer reliable, high-end services, such as leased lines, ISDN, closed user group and videoconferencing. Other services offered include Internet Service Provider (ISP), Very Small Aperture Terminal (VSAT), Radio Paging Services, Public Mobile Radio Trunked Services (PMRTS), Internet Telephony and Cable TV services.

Wireless services can be further divided into two categories: Global System for Mobile Communications (GSM) and Code Division Multiple Access (CDMA). The WLL (F) is operated under the CDMA technology. The GSM sector is dominated by players such as Airtel, Vodafone-Essar, and Idea Cellular, while the CDMA sector is dominated by Reliance and Tata Indicom.

**Global System for Mobile Communication (GSM):**

It is one of the satellite networks that have designed as a digital system. It is currently in use in over 50 countries inside and outside of Europe Global system for mobile communication work with the help of frequency above 18000MHz., GSM system has up to a maximum of 200 full duplex channels per cell. Each channel consists of downlink frequency from the mobile station. The mobile station is
located at particular distance with communication to base station, which makes the signal reachability easier. The base station is used to announce incoming calls each mobile station monitors its base continuously to watch for calls it should answer. At present global system for mobile communication technology is used by companies like Airtel, Hutch and Spice etc.

The global system for (GSM) technology is marching towards third generation (3G) and Code Division Multiple Access (CDMA) technology is ready to launch 3G services.

The first generation (1G) provided analog systems with voice as the feature while second generation (2G) of telecom technology envisaged data and voice. The 1G basically utilized analog transmission characterized by low voice articulation, distortion in the transmission media, not enabling the integrated service digital network (ISDN). The third generation (3G) technology is equipped with high speed data capabilities.

The voice requirements are no more the end in itself. People are looking for data connectivity. They are connecting the internet, browse, send and receive e-mails, download and upload information. The requirement has nevertheless stopped. While GSM is the widely used technology in Europe, CDMA technology claims that it can directly step towards 3G era with more than 384 kbps data speeds. The General Packet Radio System (GPRS) and Enhanced Digital Global Evolution (EDGE) are buzzwords in the GSM arena. The
world is witnessing 3G across the developed countries in the world and the 4G word has also crept in.

**Code Division Multiple Access (CDMA):**

It is yet another method of allocating a wireless channel. It is completely different from all other allocation techniques; Code Division Multiple Access is based on dividing the channel into frequency bands and optical fibers. It is typically used for wireless systems with fixed base station and many mobile stations depend on how far away the transmitters are, from CDMA.

**MOBILE PHONES IN RURAL AREAS:**

Mobile telephony has penetrated to every corner of the country. It has dominated other communication methods. It has made communication easy at low cost. This revolution has changed the earth itself

The mobile is very useful that nook and corner of the country is being covered. It has also made its way into rural areas. It is well known fact that rural population all over India is in majority and the entire agriculture, sericulture, horticulture is concentrated there. It is well known fact that urban development depends upon rural economy. Therefore, rural India should have mobile communication facilities. Statistics have revealed that by the end of 2009, the mobile network had covered three quarters of India’s population. Many of these ‘mobile citizens’ live in poorer and more rural areas with scarce infrastructure and facilities, high illiteracy levels and low per capita
income. The advances in mobile technology could be used to bridge the growing economic and social digital divide between rural and urban areas. Mobile phones should not be seen merely as communication medium, they should really be seen as a new and essential form of infrastructure that will transform a host of other service sectors in rural economies around the world. Mobile communication is revolutionizing economic and social life in rural India, spawning a wave of local entrepreneurs and creating greater access to social services. There are seven sectors including transport, finance and healthcare that radically transformed through mobile technologies. They are discussed below:

**Transport:**

Finding cost effective, reliable and safe ways to transport goods and services to market is a major problem for small business in rural communities. Public transport is not available in 45 per cent of villages in India, and only 1 per cent of Indian households own a vehicle. Mobile communication could be used to create and coordinate car sharing schemes amongst villages, and provide real-time information about public transport services and the ability to make request stops.

**Micro-Commerce:**

Small business in rural areas often have to travel significant distances to markets or other places they can distribute their goods, and cannot make arrangements in advance with buyers or other sellers. Mobile phones could significantly change the logistical issues faced by rural traders and home entrepreneurs, by affording mobile-based
ordering systems, delivery requests, and the ability to make more reliable and advance arrangements with business partners or clients.

**Finance:**

Mobile phones are already being used in rural areas as a tool for financial transactions by swapping airtime for goods and services. However, mobile networks and financial services institutions should work together to test, develop new financial services in this area, and address how people can transfer these credits into cash.

**Healthcare:**

New mobile services in this area could better connect rural communities, creating networks to share and discuss health information and advice.

**Governance:**

Accessing information about public service remains a major challenge for many rural communities. Mobile phones provide a new platform through which rural communities will be able to access government information and services, using, text, data and audio browsing techniques.

**Education:**

There is a wide range of educational services that could be provided via mobiles to children in remote villages and communities, particularly where PCs or connections to the internet are not available, mobile phones could serve as an essential means for children to become connected to one another for educational and peer-learning activities. These are particularly important for communities that are either nomadic or transitional on account of displacements due to a natural disaster or for other reasons.
Entertainment:

While the mainstream entertainment industry is already well aware of the emerging potential of mobile media, there are also many opportunities for local, peer-to-peer content to be created and distributed, affording new cultural and economic opportunities to rural communities.

Hence national and international governments, the mobile industry and NGOs have to work together to support the development of these services by increasing access to and use of mobile communications in rural communities.

- Local and state government needs to integrate their telecom regulatory, tax and rural development policies, do more to incentives, and support the mobile services across the country.

- The mobile industry needs to understand the social impact of mobile connectivity in rural communities and make it as accessible as possible to them. This does not only mean lower prices and costs of ownership, but also need to localize the mobile experience with relevant applications and services to make a real contribution to development. Many of these will be innovated at a grass roots level and it is important for the mobile industry to work at this level to deliver real improvements.

- Non-government organizations have an important role to play in working with state agencies to define the needs of rural communities and together develop new ways to deliver a wide range of different social and welfare services. To do this they
also need to work much more closely with the mobile industry to understand and test the technological possibilities.

The telecommunication industry in India is estimated to be worth Rs. 600 bln. India has one of the fastest growing telecommunication systems in the world. Given the low telephone penetration rate, India offers vast scope for growth. The major policy reforms initiated since 1999 have resulted in the fastest ever expansion of the telecom network. Telephone lines added to the basic services network over the last 5 years 2002 – 07 have been one and a half times that added over the preceding five decades. The variety of telecom services being offered now to the users is amazingly vast. This has been possible because of opening up of all the telecom services for the private sector without any restriction on number of operators except for the cellular mobile phone segment due to frequency constraints. The following graphics give some idea of the market size.

**Growth:**

The total number of telephones increased from 76.53 million by the end of March 2004 to 413.85 million by the end of February 2009. About 113.36 million telephones, at the rate of more than 14 million subscribers every month, were added during the 11 months of 2008 – 2009. Total tele-density increased from 12.7 percent in March 2006 to 35.65 percent in February 2009. While rural tele-density reached 13.81 percent in January 2009, the urban tele-density shot up to 83.66 percent (Table 1.1 and figure 1.2).

### Table 1.1

**Growth of telephones over the years**

(No. in million)

<table>
<thead>
<tr>
<th></th>
<th>March 06</th>
<th>March 07</th>
<th>March 08</th>
<th>Feb 09</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed lines</td>
<td>40.23</td>
<td>40.77</td>
<td>39.41</td>
<td>37.83</td>
</tr>
<tr>
<td>CDMA</td>
<td>32.67</td>
<td>44.62</td>
<td>68.38</td>
<td>92.14</td>
</tr>
<tr>
<td>GSM</td>
<td>69.19</td>
<td>120.47</td>
<td>192.70</td>
<td>283.98</td>
</tr>
<tr>
<td>Wireless</td>
<td>101.86</td>
<td>165.09</td>
<td>261.08</td>
<td>376.12</td>
</tr>
<tr>
<td><strong>Gross Total</strong></td>
<td>142.09</td>
<td>205.86</td>
<td>300.49</td>
<td>413.85</td>
</tr>
</tbody>
</table>

**Annual Growth (%)*

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<td></td>
<td>44</td>
<td>45</td>
<td>45</td>
<td>37.72</td>
</tr>
</tbody>
</table>

Source: Department of Telecommunications

Notes: * point to point

### Fig. 1.2

**Tele-density by end March (2002 – 2009)**

![Graph showing tele-density](image-url)
While the wireless subscriber base grew at a compound annual growth rate (CAGR) of 75.9 per cent per annum since 2003, the wire-line segment has been declining gradually. The share of wireless phones increased from 24.3 per cent in March 2003 to 90.88 percent in February 2009. Improved affordability of wireless phone has made universal access objective more feasible. The government has taken several steps directed at reduction in entry barriers, creation of a level-playing field between incumbents and new entrants and forward looking regulation. Consequently, the share of private sector in total telephone connections increased to more than 79 per cent in February 2009 against a meager 5 percent in 1999.

Rural telephony:

With the special thrust given to rural telephony, the number of rural telephones went up from 12.3 million in March 2004 to 112.71 in January 2009 4. The strategy for rural network expansion involves provision of phones through market mechanisms in the viable areas and through universal service obligation (USO) fund in the non-viable areas. While village public telephones (VPTs) and rural community phones (RCPs) will enable public access, the scheme of RCPs has been launched under USO (F) to create the infrastructure in rural and remote areas. Out of more than 22.71 lakh public call offices (PCOs) functioning in the country, two lakh are in the rural areas. The mobile Grameen Sanchar Sewak scheme providing telephone at the doorstep of villagers is in place in about 12,000 villages.

4. Loc. Cit.
Internet/ Broadband:

Recognizing the importance of increasing broadband connectivity for the growth of knowledge based society, several steps have been taken to promote broadband. As a result, the broadband subscribers grew from a meager 0.81 million as on March 2005 to about 5.69 million by February 2009.

An agreement has been signed with BSNL in January 2009 to provide wire-line broadband connectivity to rural and remote areas by leveraging the existing 27,789 rural exchanges and copper wire-line network and by facilitating the service providers in creating broadband infrastructure. Under this, BSNL would provide 8,61,459 wire-line broadband connections from rural telephone exchanges with subsidy from USO Fund 5. The rural broadband connectivity will cover Government institutional users from panchayats, higher secondary schools, public health centers and individual users. Subsidy would also be provided for setting up one kiosk from each rural exchange for providing public access to broadband services.

A proposal is being considered to provide broadband connectivity in rural and remote areas in phased manners, under which 5,000 blocks would be connected by wireless broadband and villages coming within a radius of 10 kms. of the taluk/block headquarters would be covered. Guidelines have been issued for Broadband Wireless Access (BWA) services. BWA services will increase broadband penetration.

**Foreign direct investment:**

Foreign direct investment (FDI), an important source to meet the resources for rapid network expansion, is presently permitted in various telecom services from 74 per cent to 100 per cent. The total FDI inflows since January 2000 to December 2008 are Rs. 27,482.96 crore and the inflow during 2008 is Rs. 11,595.48 crore. The last four years saw many renowned telecom companies setting up their manufacturing base in India. With the Government initiatives, leading world majors in telecom equipments like Nokia, Motorola, Sony Ericson, Samsung, Flextronics and LG Electronics have set up their mobile phone manufacturing units meeting more than 50 percent of the domestic demand, besides exports. Nokia-siemens Network, Ericson and Tejas Networks have set up their manufacturing units for wireless equipments including BTS and complete transmission equipment within the country. With a view to promote and develop exports of telecom equipments and services, the Government has already set up Telecom Equipments and Services Export Promotion Council.

**Activities under Universal Service Obligation Fund:**

USO Fund continues to subsidize the developments in rural telecom sector through the following:

- Under operation and maintenance of village public telephone (VTP) about 5,49,133 VPTs are currently eligible for financial support as on 28.02.2009. In line with the agreements were signed with BSNL in November 2001 to provide subsidy support for

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provision for VPTs in 66,822 uncovered villages, 56,736 VTPs have been covered by BSNL as on 28.02.2009. The remaining will be covered in a phased manner by November 2009.

- Under agreements signed in September 2004 for providing 40,705 rural community phones (RCP) in villages with population of more than 2,000 and not having PCO facility, 40,616 RCPs have been provided till February 2009.

- Multi-access radio relay (MARR)-based CPTs installed before April 2002 are being replaced under USO (F). Out of a total of 1,86,872 MARR-based VPTs, 1,83,756 have been replaced till February 2009.

- USO(F) support is given for provisioning of rural direct exchange lines (RDELs) in all the 1,685 net cost positive short distance charging areas (SDCAs).

- A Scheme has been launched by the Government to provide support for setting up and managing 7,871 infrastructure sites spread over 500 districts in 27 states for the provision of mobile services. The infrastructure so created shall be shared by three service providers for provision of mobile services. Mobile services from these towers are planned to be launched in a phased manner. As on 28.02.2009, about 3,941 towers have been set up under this


scheme. Mobile services from about 3,715 BTs installed on many of these towers have started. About 10,128 towers are proposed to be installed under second phase of the scheme.

The Eleventh Five Year Plan has targeted to provide the broadband for all secondary and higher secondary schools; all public health care centers and gram panchayats. It is also envisaged that internet and broadband subscribers will increase to 40 million and 20 million respectively, by 2010.

Centre for Development of Telecommunications (C-DOT): C-DOT was established by the Government of India in 1984 as an autonomous body with the objective of developing a new generation of digital switching systems. C-DOT’s current focus is on development and deployment of next generation networks and cost effective rural wireless solutions.

Market Players:

The competition varies across the segments but the current players include the state-owned operators as well as private operators. In the public sector the main players are:

- Bharat Sanchar Nigam Ltd. (BSNL)
- Mahanagar Telephone Nigam Ltd. (MTNL)

Efforts are now being made to achieve the target of 600 millions telephone subscribers by the end of eleventh five-year plan. It is also

10. Loc. Cit.
11. Ibid., p. 248
proposed to achieve rural teledensity of 25 percent by means of 200 million rural connections at the end of the eleventh five-year plan\textsuperscript{12}.

In the private sector the main players are:

- Bharti Telenet Ltd.
- Reliance Telecom Ltd.
- Tata Teleservices Ltd.

Some of them like Reliance have an interest in the basic (Both wired and wireless) services as well the national and international long distance services. Others like Bharti are concentrating on providing cellular services. Competition also differs in terms of the geographical coverage they want. For example, Reliance Infocom, given its big bang approach, plans to cover all the 18 telecom circles in India. As against this, Bharti seems to be focusing on south and north Indian circles.

**Government Regulations:**

For long Telcom was a state-monopolized sector. However around 1994, the government realized the importance of the sector for the entire economy and the difficulty in raising funds. The government also realized that unless private participation was allowed in the sector leading to the interplay of market forces, the ultimate benefits would take long to trickle down to the customers. This led to the opening of the telecom sector to private players.

Cellular mobile services were one of the first areas to be opened up to private competition. The whole country was divided into the 4

\textsuperscript{12} Ibid 247
metropolitan cities and 19 telecom circles, which were roughly analogous with the states of India. Cellular Licenses were awarded to the private sector – first in the metropolitan cities of Delhi, Mumbai, Kolkata and Chennai in 1994 and then in the 19-telecom circles in 1995.

Seeing the vast untapped potential of the Indian market, a host of companies stepped in FDI up to a maximum of 19% was allowed in this sector. The chief telecom regulatory body, Telecom Regulatory Authority of India (TRAI), was set up. The TRAI Act allows the body, among other things, to set telecom tariffs and fix terms and conditions. It also requires the government to seek recommendations from TRAI before issuing a license. A new appellate authority, Telecom Disputes Settlement Appellate Tribunal (TDSAT) – separate from TRAI – has been set up to decide on disputes between the government and private operators. Of late the Indian government has merged the IT and Telecom Ministries to speed up reforms and has tabled the Communication Convergence Bill in the Parliament to enable the common regulation of the internet, broadcasting and telecom.

**Market Trends:** Some of the visible market trends in the India Telecom Industry are detailed below:

1. **Increasing role of the cellular Sector**—According to JM Morgan Stanley, the telecom services market in India will have to expand by 9.4% annually for the next five years 2005 – 2010 with the cellular segment as the key growth driver.
2. **Increasing share of the private operators** - The share of public operators in this market is likely to diminish and competition would establish itself faster and get a bigger chunk of the market. The private sector participation has increased to about 20 per cent in December 2008 from about 5 per cent in December 1998.

3. **Rural Telephony** - More than 84 per cent of the villages have been provided connectivity by BSNL through more than 5 lakh VPTs (Village Public Telephones) by the end of December 2008. The private sector has also provided 7123 VPTs. Thus, the number of villages covered by VPTs increased from 4.68 lakh in March 2008 to 5.10 lakh as on December 21, 2008. The rural lines as a proportion of the total number of lines have increased from about 20% in 1999 to more than 30% in 2008.

4. **Tariff Rebalancing Measures** – In response to the policy changes in the Indian Telecom Sector, the tariff structure has been altered substantially. The tariff for Domestic Long Distance (DLD) has been reduced by 54 per cent and that for the International Long Distance (ILD) has been reduced by almost 44 per cent compared to the 1999 prices.

5. **The Digital Gap** - The digital gap measured in terms of tele-density amongst various states and within the States specifically those having large geographical areas and huge populations are quite visible. The southern states including Maharastra have tele-density more than the national average of 4.90 while the western region except for Gujarat, Central and North-East
regions have a tele-density much lower than the national average.

All these would be led by further liberalization, increasing customer expectations in terms of service as well as reduced tariffs, and the convergence of technologies to provide value added services to the customer.

**Fixed Telephony, WLL or Cellular Services?**

A new subscriber to the telecom service basically has three options to choose from – the basic landline phone, WLL (Limited Mobility) and Cellular Services. It would be interesting to study what makes him choose one of these services.

Fixed line telephony provided by the likes of MTNL and BSNL – with an installed base of about four crore users – it is force to reckon with in the Indian telecom landscape. However with the coming of the new pulse rates, increase in the rentals and the imposition of interconnect charges to be paid for calls ending in the cellular and WLL phones, this is going to be much more expensive than before.

On the other hand GSM and WLL players have been at the forefront of bringing in changes with innovative offering and slashing call rates. With a subscriber base in excess of one crore, this customer segment is gradually gaining prominence.
Customers who have high degree of mobility and who would like to be reached on one number regardless of their physical location would be ideal candidates for mobile phones. A host of value-added features, such as short messaging service/multi-media messaging service, internet access on the phone, access to services such as updates on cricket scores and railway reservation status, to name a few only serve to enhance the attractiveness of mobiles.

WLL operators have also rolled out limited mobility services that hold out considerable appeal to those whose movements are limited to a particular area. By providing for the cost competitiveness of a basic telephone coupled with the feature of limited mobility, this is set to compete ahead on with basic services in the near future.

**Issues before the Industry:**

The industry is currently grappling with a host of issues, which might hinder the pace of growth. Some of them are:

**Financing of projects:**

Upfront licensing fees and bank guarantees form a sizeable part of initial investments. For bigger players like the Tatas or Reliance this might not pose any significant problem. However, for smaller players raising finances is a major issue. The resources of these operators are limited and the only way they can meet their funds requirement is through foreign direct investment (FDI). Attracting FDI in the telecom sector has not been easy.
Market Overview and Growth Trends:

The telecom market is glittered with players in each of the segments (fixed line, cellular, limited mobility). The fixed wire line market share is dominated by the state operators, BSNL and MTNL, who together accounts for 92 per cent of the total subscriber base. Private sector services are presently available in selecting urban areas and collectively account for remaining 8 per cent of the subscriptions some of the prominent players and their current offerings are discussed below. All these players have interests across segments.

Wireline and Wireless Services

The telecom network has shown a noteworthy growth in recent times, with the tele-density reaching 18.2 per cent in March 2007, thus marking an increase of 42.4 per cent over the previous year. The sector has recorded a remarkable growth backed by the steep increase in mobile subscriber base and also various tariff plans launched by services providers.
The above figure shows that, the GSM segment grew much faster than the CDMA segment. While the CDMA segment grew at 113.18 per cent in Financial Year 2007, the GSM segment grew by 74.08 per cent during the same period. The GSM segment had a subscriber base of 120.47 million as of March 2007, 73 per cent of the total 165.11 million subscribers in the wireless segment, whereas the CDMA subscriber base stood at 44.64 million.

By end of March 2007, the total wireless subscriber base in India stood at 165.11 million, up from just 13 million during March 2003. The wire line subscriber base declined from 41.54 million by end of March 2006 to 40.75 million by end of March 2007. The average revenue per user (ARPU) per month has also declined

Source: TRAI
substantially. All India blended ARPU for GSM (per month) for the year ending March 2007 was Rs 298 as compared with Rs 366 for the year ending March 2006. Similarly, ARPU for post-paid services declined by 2.39 per cent from Rs 628 in March 2006 to Rs 613 in March 2007. Prepaid ARPU declined by 16.1 per cent from Rs 298 in March 2006 to Rs 250 in March 2007. On the other hand, in post-paid, Minute of Usage (MOU) per subscriber increased from 709 in the quarter ending March 2006 to 1050 in the quarter ending March 2007. Likewise, prepaid MOU also surged from 312 to 384.

**Market Share**

In CDMA, Tata Teleservices registered a healthy growth, as its subscriber base rose from 4.85 million at the end of March 2006 to 16.02 million at the end of March 2007; similarly, BSNL’s subscriber base also reached 3.55 million from just 0.49 million during the same period. Reliance’s subscriber base stood at 24.62 million at the end of March 2007 from 15.41 million against the same period in the previous year.

In GSM, Airtel continues to be the largest service provider by end-March 2007, with a subscriber base of 37.14 million (up from 19.58 million in the previous year). BSNL’s GSM subscriber base stood at 27.43 million at the end of FY07 from 17.16 million during the corresponding period previous year. Likewise, Vodafone-Essar (Formerly known as Hutch) also recorded high growth in terms of GSM subscriber to reach 26.44 million at the end of FY07 against 15.36 million in FY06.
Fig 1.4
Market Share of CDMA Operators (As of March 2007)

Source: TRAI

Fig 1.5
Market Share of GSM Operators (As of March 2007)

Source: TRAI
Public and Private Sector

During FY00-FY07, the PSU operators’ subscriber base had gone up steeply, with the absolute growth being 44.88 million. During this period, the PSU operators continuously surpassed the private players. However, the private player’s subscriber base increased at a Compound Annual Growth Rate (CAGR) of 82 per cent during FY2000-FY2007.

Fig 1.6
Public and Private Sector Contribution

Source: TRAI. (Includes Wireless and Fixed Line)

Tata Teleservices:

Tata Teleservices is part of the Rs 54,000 crore Tata Group that has over 90 coms, 210,000 employees and more than 2.16 million
shareholders. With an investment of over Rs. 9,000 crore in telecom, the group has a formidable presence across the telecom value chain. Incorporated in 1996, Tata Teleservices operates in 20 circles across India and provides fixed wireless, wire line, value added services, and mobile telephone services.

Role of Videsh Sanchar Nigam Limited (VSNL):

VSNL today a part of the Tata group and was incorporated on April 1, 1986. The company operates a network of earth stations, switches, submarines cable systems and provides a range of basic and value added services. VSNL’s main gateway centers are located at Mumbai, New Delhi, Kolkatta and Chennai.

Bharat Sanchar Nigam Limited (BSNL)

The constitution of Bharat Sanchar Nigam Limited (BSNL) on 1st October 2000 was one of the landmark events in the history of Telecommunications in India. Today, BSNL is the largest public sector undertaking of the nation serving more than 34 million customers. It has the responsibility to improve the quality of telecom service, ensure the expansion of telecom network to encompass the entire nation. BSNL is into providing the whole gamut of services including fixed line, limited mobility and cellular services (through the newly launched Cell One). The financial performance of BSNL is shown in the following graphic.

13. www.bsnl.com
Fig. 1.7
Revenue Earned by BSNL during five years period 2004–05 to 2008–09

Source: www.bsnl.com

Fig. 1.8
Gross Fixed Assets of BSNL

Source: www.bsnl.com
Recently the company introduced its cellular service, Cell 1 in almost all the telecom circles in the country. Within a span of a few months, it has managed to corner the number either two or three position in all the circles except in Tamil Nadu and Madhya Pradesh. Unlike private service providers who focus only on certain areas, where they can get maximum return on investment, for BSNL, it's more the better as it has the entire requisite infrastructure in place.

Only a small incremental cost is required to provide cellular service in newer areas. The most commendable thing about this achievement is that almost 95% of its customers are new users\(^\text{14}\) and not the ones that have migrated from some other service provider.

Some of the factors to which this huge success can be attributed are:-

1. Tariff Plans: The tariff plans designed by BSNL have substantially lowered the entry costs for new subscribers.

2. Simplicity of tariff plans: BSNL's tariff plans are less in number and easy to understand. This is in contrast to some operators who have as many as 80 tariff plans each more complex than the other.

3. Excellent network design and coverage- BSNL's service covers as many as 1100 cities and towns throughout the country. The cellular network design of BSNL is excellent and provides very good coverage in both notional and state highways making it ideal for those who are roaming inter-state as well as intra-state. This has given BSNL a lot of good word of mouth publicity.

\(^{14}\) www.bsnl.com
Some of the plans that BSNL has for future are:

1. Broadband Services – It is all set to roll out its broadband services. This would be a key to neutralizing the decline in earnings from plain voice services and boost its bottom line. By end of this year they plan to offer this service in 84 cities.

2. Enterprise Customers – BSNL is aggressively targeting enterprise customers with a two fold strategy centered on technology and network upgradation and marketing and customer care. It has also come up with a corporate Group Billing Scheme where in the corporate will get a single bill for all the group companies. Discounts will be offered to group billing customers.

3. Customer Service – BSNL plans to set up 3200 customer service centers to help customers, primarily corporate. The existing interface of BSNL is getting a facelift and the employees are being put through special training sessions.

4. CDMA plans – BSNL plans to go slow on its CDMS plan. It plans to reach just 70 cities in the next couple of months. This is because it wants the controversy regarding the limited mobility services to settle down.

5. Outsourcing – BSNL is looking at outsourcing of bill collection and processing services.
However some concerns that have to be taken care of are network expansion and SIM card procurement. In addition, its existing tariff offers it a low ARPU (Average Revenue per User) and it might find it difficult to sustain this in the long run.

GROWTH PLAN

BSNL has continued its growth story ever since its formation and has reached a customer base of 81.49 million as on 31st March 2009 from 28.11 million as on 31st March 2001. BSNL further Plans to increase its customer base to 160 million by March 2014 15.

New Services introduced/planned by BSNL

3G Services: BSNL has started 3G services in 290 cities and acquired more than 6 lakh customers. It has planned to roll out 3G services in 760 cities across the country in 2010 – 11.

Broadband Services: The shift in demand from voice to data has revolutionized the very nature of the network. BSNL is poised to cash on this opportunity and has planned for extensive expansion of the Broadband service. The Broadband customer base of 3.56 million customers in March 2009 is planned to be increased to 16.00 million by March 2014.

BSNL is also offering prepaid Broadband services. The customers availing prepaid broadband have many advantages over post paid broadband like control on usage mobility etc.,

15. www.bsnl.com
In addition to wire line broadband services, BSNL is also in the process of rolling out its Wi-MAX network in rural areas to take an initial lead and provide wireless broadband services in all rural blocks in the country during 2010-11. The urban Wi-Max is also being deployed in Kerala & Punjab Circles and shall cover all the major cities in these circles.

Wi-Max Services are also being provided through a Franchisee agent with M/s SOMA in three states of Gujarat, AP and Maharashtra.

**Value Added Services:** BSNL is focusing on provision of value added services/features to attract high end customers and to double its revenues from Value Added Services.

**Fiber to Home (FRTH):** To meet the demand for high band width services, BSNL is rolling out FRTH services (GPON & GE-PON) for the first time in the country, which is likely to generate substantial revenue in coming years. Services are likely to start by March 2010.

**Mobility in WLL:** BSNL has announced full mobility on its WLL network from March 2010.

Mahanagar Telephone Nigam Limited (MTNL) was set up on 1st April, 1986 by the Government of India to upgrade the quality of telecom services, expand the telecom network, and introduce new services and to raise revenue for telecom development needs of India’s key metros – Delhi, the political capital and Mumbai, the business
capital of India. In the past 16 years, the company has taken rapid strides to emerge as India’s leading and one of Asia’s largest telecom operating companies. Besides having a strong financial base, MTNL has achieved a market share of approximately 13 per cent of the Indian telecommunication network with a customer base of over 4.74 million lines.

Some of the factors that have contributed to the immense success of MTNL in the telecom sector are:

- Tremendous resources and asset base
- Cost reduction due to induction of new technologies and computerization
- Increasing demand for such services in a fast developing economy.

MTNL is into providing both WLL (through ‘Garuda’) and cellular services (through ‘Dolphin’).

1. **Garuda:-** The WLL services are provided both in the fixed mode as well as in the mobile mode. MTNL has been providing these services for a long time now.

2. **Dolphin:-** MTNL has been licensed to operate cellular services in National Capital Region (NCR) of Delhi (including its four satellite towns of Ghaziabad, Noida, Faridabad & Gurgaon) and Mumbai (including Navi Mumbai & Kalyan). This comes packed with host of value added services like auto roaming, prepaid, voice mail service, short message service, multi-party conference, closed user group, etc.,
With the increased economic activity due to liberalization, growth of lines is expected to be around 4,00,000 a year. The opening up of value added services is an area which will considerably add to the prospects of MTNL due to greater utilization of the existing network, to provide connectivity for these services will be very nominal.

**Reliance Infocomm:**

Reliance is one of the industrial powerhouses of the country with interests in petrochemicals, textiles, software, telecom etc. In the telecom services sector, the reliance strategy has been to straddle all three segments of operations- fixed-line, mobile and limited-mobile, or will services, Reliance has licenses for basic telecom operations in 18 basic circles, but it did not bid for any cellular license other than the seven licenses that it had from the initial foray in the first round of license auctions. Instead, it appears to have placed its bets rather early on the CDMA platform, through Reliance Infocomm.

Launched in February 2003, Reliance Infocomm has plans to offer a complete range of telecom services, covering mobile and fixed-line telephony, including broadband, national and international long distance services, data services and a wide range of value-added services and applications. It plans to eventually cover 673 cities and towns of India through its network.

On the basic services front, the Tata group acquired Hughes Tele.com in Maharastra and now has consolidated operations by becoming the number one private basic services provider. During the

last fiscal the company also launched its services in Delhi, Karnataka, Tamil Nadu, and Gujarat.

Tata Tele services have realized the importance of customer service in this industry. It has invested in not just 24/7 call centers but also in company managed showrooms where any customer can experience the totality of its offerings, demonstrations of various products, get information on tariff plans, handsets, connection and bill payments.

Earlier group companies were targetting the corporate on an individual basis. With the view of offering customized end-to-end telecom solutions to corporate, Tata Tele services along with other Tata group companies like VSNL and Tata Internet Services Limited (TISL) has formed the Tata Enterprise Business Unit (TEBU) to act as single point interface to deliver telecom services to key corporate customers. In order to better understand and service the unique telecom requirements of the corporate customers, TEBU has organized itself in industry vertical groups like Banking and Finance, Retail, Transport etc.

**Bharti Televentures Limited:**

Bharti Tele-ventures, one of the main holding companies of the unlisted Bharti Enterprises has emerged as one of the strongest players in the fast-changing and rapidly growing Indian telecommunications market. As of September 20, 2001, approximately 92 per cent of India's total number of cellular subscribers resided in Bharti’s existing and proposed cellular circles.
The company provides cellular services in fifteen of the 22 circles using Global System for Mobile Communication (GSM) technology. It also provides fixed-line services in the Madhya Pradesh Circle and is developing fixed-line networks in the circles of Delhi, Haryana, Karnataka and Tamil Nadu. It also has a strategic interest in national long distance and broadband services besides being a serious contender for the International Long Distance Telephony Services.

The Company enjoys strong brand name recognition and has a reputation for offering high quality service to its customers. Some of the brands in the company’s portfolio are Airtel (post paid products), Magic (pre paid cellular brand) and Mantra Online (ISP Services).

The Telecom Services Comparative Analysis:

After having had a look at the offering of the players, it would be worthwhile to do a comparative evaluation of the services offered by these players. The framework that is used is that of placing the operators on a perceived customer price-benefit-map. The greater the perceived benefits and the lower the price of the service, the higher is the customer value and more are the chances that the customer will choose that service. This is shown in the following graphic. The horizontal axis of the value map shows the customer perceived benefits and the vertical axis represents the perceived benefit by the customer.
Fig. 1.9
The Price-Benefits Analysis

1 – Fixed Telephony
2 – Tata Indicom, Garuda (MTNL), Tarang (BNSL)
3 – Dolphin (MTNL), Cellone (BSNL)
4 – Private cellular operators (Airtel, Hutch, Idea, BPL Mobile, etc)
5 – Reliance Infocomm

As is expected Fixed Telephony (indicated by 1) is low both on the perceived pricing and perceived benefit fronts. WLL companies (indicated by 2) like Tata Indicom, BSNL and MTNL seem to have clearly positioned their services as the poor man’s mobile, with tariffs much below that of the private cellular operators and almost at par with the fixed telephony providers. They are mainly targeting the
mass market. They are hoping that a new telephone subscriber will take up their service instead of going for the fixed phone for his personal communications. These companies fare better than the fixed telephones on the perceived-benefit axis because of the mobility factor. They are not a source of worry for the cellular operators (indicated by 4)

However, the Reliance service (indicated by 5) is a cause of concern for the cellular operators. Reliance is offering almost the same perceived benefits as any cellular operator. An example of this is the inter-SDCA roaming available to Reliance Subscribers (when they move out to a different SDCA, they can still use the service albeit under a different number). Reliance is also promising a host of value added services like internet surfing, games etc. To compound their woes, Reliance fares much better on the perceived pricing front. In this situation the cellular operators have to pick one of the two options – either ramp up their benefits side or match Reliance’s tariffs. Only time will decide if they are successful in doing so.
<table>
<thead>
<tr>
<th>Country</th>
<th>Population (Million)</th>
<th>GDP (Per capita US$ 2006)</th>
<th>Telephones (thousands)</th>
<th>Tele density (%)</th>
<th>Internet Users (000) 2006</th>
<th>Broad band Subscribers (000) 2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>301.03</td>
<td>41,768</td>
<td>405,031.9</td>
<td>134.55</td>
<td>208,000.0</td>
<td>58,136.6</td>
</tr>
<tr>
<td>UK</td>
<td>59.85</td>
<td>37,319</td>
<td>103,259.1</td>
<td>172.54</td>
<td>33,534.0</td>
<td>12,995.1</td>
</tr>
<tr>
<td>Australia</td>
<td>20.37</td>
<td>32,512</td>
<td>29,700.0</td>
<td>145.83</td>
<td>15,300.0</td>
<td>3,900.0</td>
</tr>
<tr>
<td>Brazil</td>
<td>188.88</td>
<td>4,278</td>
<td>126,063.0</td>
<td>67.83</td>
<td>42,600.0</td>
<td>5,921.9</td>
</tr>
<tr>
<td>Mexico</td>
<td>108.33</td>
<td>7,180</td>
<td>76,877.3</td>
<td>70.97</td>
<td>18,091.8</td>
<td>3,728.2</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>20.91</td>
<td>1,135</td>
<td>7,296.6</td>
<td>34.89</td>
<td>428.0</td>
<td>29.1</td>
</tr>
<tr>
<td>Korea (Rep)</td>
<td>47.98</td>
<td>16,309</td>
<td>67,063.0</td>
<td>139.76</td>
<td>34,120.0</td>
<td>14,042.7</td>
</tr>
<tr>
<td>Japan</td>
<td>128.22</td>
<td>35,592</td>
<td>156,853.0</td>
<td>123.33</td>
<td>87,540.0</td>
<td>25,755.1</td>
</tr>
<tr>
<td>Indonesia</td>
<td>225.46</td>
<td>1,263</td>
<td>78,623.7</td>
<td>34.87</td>
<td>16,000.0</td>
<td>108.2</td>
</tr>
<tr>
<td>China</td>
<td>1,323.64</td>
<td>1,732</td>
<td>828,844.0</td>
<td>62.62</td>
<td>137,000.0</td>
<td>50,916.0</td>
</tr>
<tr>
<td>Pakistan</td>
<td>157.0</td>
<td>718</td>
<td>39,746.6</td>
<td>25.32</td>
<td>12,000.0</td>
<td>56.6</td>
</tr>
<tr>
<td>India</td>
<td>1,119.54</td>
<td>726</td>
<td>205,860.0</td>
<td>18.47</td>
<td>858,200.0</td>
<td>2,300.0</td>
</tr>
<tr>
<td>world</td>
<td>6,562.64</td>
<td>6,886</td>
<td>3,920,998.9</td>
<td>59.93</td>
<td>1,927,531.7</td>
<td>280,844</td>
</tr>
</tbody>
</table>

*India- As on March 2007, # TRAI
Source: International Telecommunication Union & TRAI

The above table shows India’s position in terms of world tele-density, which is quite low as compare to its peers. However, considering its rising income, favourable government policies, its tele-density is definitely going to improve over the next couple of years favoured by rise in per capita income, burgeoning IT/ITES, retail, textile, pharmaceutical, banking and financial sector etc. and the emergence of one of the largest telecom subscriber bases in the world.
India-China Comparison

Table – 1.3
ARPU- India-China Comparison

<table>
<thead>
<tr>
<th>Particulars</th>
<th>India</th>
<th>China</th>
</tr>
</thead>
<tbody>
<tr>
<td>APRU-Basic</td>
<td>14.5</td>
<td>15</td>
</tr>
<tr>
<td>APRU-Mobile-CDMA</td>
<td>5.56</td>
<td>5.74</td>
</tr>
<tr>
<td>APRU-Mobile-GSM</td>
<td>8.0</td>
<td>8.89</td>
</tr>
<tr>
<td>APRU-Mobile-GSM Post-paid</td>
<td>14.0</td>
<td>20.34</td>
</tr>
<tr>
<td>APRU Mobile-GSM pre-paid</td>
<td>6.0</td>
<td>5.25</td>
</tr>
</tbody>
</table>

FY06- Apr-Mar; 2005 Jan-Dec
Source: Annual Reports of Chinese Telecom & TRAI

Above table shows that India’s ARPU in terms of basic, CDMA etc are relatively low as compared to China in 2004 and 2005. During FY06, the total revenue from telecom services in India was around US$ 19.5 billion, while the total revenue in China was US$ 72.7 billion (January-December 2005).

Table – 1.4
India-China Comparison of GSM and CDMA

<table>
<thead>
<tr>
<th>Particulars</th>
<th>India</th>
<th>China</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>FY06 (minutes)</td>
<td>FY05 (minutes)</td>
</tr>
<tr>
<td>GSM Total</td>
<td>393</td>
<td>330</td>
</tr>
<tr>
<td>GSM Prepaid</td>
<td>308</td>
<td>233</td>
</tr>
<tr>
<td>GSM Postpaid</td>
<td>675</td>
<td>599</td>
</tr>
<tr>
<td>CDMA</td>
<td>470</td>
<td>N.A</td>
</tr>
</tbody>
</table>

Source: Annual Reports of Chinese Telecom & TRAI
Telecom Equipment

Considering the steady growth of cellular and wire line connections in the country, telecom equipment manufacturers are looking at huge opportunities from domestic players as well as in the international market. Telecom equipment recorded a CAGR growth of 7.4 per cent during FY03 to FY05. According to Planning Commission of India, it is expected that during the Eleventh 5-year Plan period, telecom equipment worth US$ 73 billion would be required and the export potential would be worth US$ 12 billion.

Table-1.5

Telecom Equipment and Exports

<table>
<thead>
<tr>
<th>Year</th>
<th>Production (Rs bn)</th>
<th>Export (Rs bn)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY03</td>
<td>144.00</td>
<td>4.02</td>
</tr>
<tr>
<td>FY04</td>
<td>140.00</td>
<td>2.50</td>
</tr>
<tr>
<td>FY05</td>
<td>160.90</td>
<td>4.00</td>
</tr>
<tr>
<td>FY06</td>
<td>178.33</td>
<td>15.00</td>
</tr>
</tbody>
</table>

Source: Planning Commission of India

Telecom Infrastructure

With the telecom subscription base increasing every month by around 6.5 million, the telecom infrastructure sector plays a crucial role in meeting the growing demand from the sector. Rising call traffic, limited bandwidth and significantly, limited telecom towers have become one of the important challenges for telecom companies in India. As on May 2007, there were around 110,000 towers shared by
more than 177 million subscribers. As the Indian government has set the target of 500 million connections by 2010, around 330,000 towers will be required in the next 3 years, that is, another 220,000 towers from the existing 110,000. This would attract investments to the tune of Rs 660 billion over the next 3 years.

<table>
<thead>
<tr>
<th>Companies</th>
<th>Current status</th>
<th>No of towers in 2010</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bharti</td>
<td>40,000</td>
<td>60,000</td>
<td>1,00,000</td>
</tr>
<tr>
<td>Relians</td>
<td>15,000</td>
<td>40,000</td>
<td>55,000</td>
</tr>
<tr>
<td>BSNL</td>
<td>14,500</td>
<td>38,000</td>
<td>52,500</td>
</tr>
<tr>
<td>Vodafone-Essar</td>
<td>20,000</td>
<td>31,000</td>
<td>51,000</td>
</tr>
<tr>
<td>Idea</td>
<td>7,000</td>
<td>18,000</td>
<td>25,000</td>
</tr>
<tr>
<td>Tata</td>
<td>7,000</td>
<td>18,000</td>
<td>25,000</td>
</tr>
<tr>
<td>Others</td>
<td>6,000</td>
<td>9,000</td>
<td>15,000</td>
</tr>
<tr>
<td>Total</td>
<td>1,09,500</td>
<td>2,11,000</td>
<td>3,20,500</td>
</tr>
</tbody>
</table>

Source: Annual Reports of Chinese Telecom & TRAI

Outlook

India continues to be one of the leading countries in the telecom sector with a CAGR growth of 39.33 per cent during FY03 to FY07. With unified licensing, the government has ended the license Raj in telecom, resolved all litigations, created a level-playing field for all operators and paved the way for faster and sustainable growth of the telecom industry. On the demand side, reduction in tariffs and cost of
TELECOM POLICY STATEMENTS:

We are now living in the era of liberalization with global technological environment. The telecom services offered in India by various service providers should technologically match the telecom industry expectations across the world to provide real time and reliable connectivity. The individuals and corporate houses, which were hitherto missing the linkage with the global connectivity at affordable prices, are now dictating the service providers for the quality of service expectations and the service providers are now required to meekly prepare proactively to meet the insatiable and ever increasing expectations of these consumers. Accordingly, it is of vital importance to the country that there should be a comprehensive and forward looking telecommunications policy, which creates an enabling framework for the development of this industry.

New Telecom Policy (NTP) – 1994

Government came out with 1994 Telecom Policy which envisaged the following important measures:-

1. Ensuring the availability of telephone on demand as early as possible.

2. Provision of access to all people for certain basic telecom services at affordable and reasonable prices covering all villages.
3. Providing quality of telecom services of world standard and removal of consumer complaints, dispute resolution and public interface will receive special attention.

4. Ensure that India emerges as a major manufacturing base and major exporter of telecom equipment.

5. Protecting the defence and security interests of the country.

New Telecom Policy (NTP) – 1999

Further to the telecom 1994 policy, the industry realized that it was far way to go forward. The technical advancements, falling prices and liberalized Foreign Direct Investment (FDI) policies made the Government to announce another forward looking NTP in 1999 and the highlights are as given below:

1. Meeting the needs of the country’s economy;

2. Encourage development of telecommunication facilities in remote, hilly and tribal areas of the country; Access to telecommunications is of utmost importance for achievement of the country’s social and economic goals. Availability of affordable and effective communications for the citizens is at the core of the vision and goal of the telecom policy.

3. Strive to provide a balance between the provision of universal service to all uncovered areas, including the rural areas, and the provision of high level services capable of meeting the needs of the country’s economy.
4. create a modern and efficient telecommunications infrastructure taking into account the convergence of IT, media, telecom and consumer electronics and thereby propel India into becoming an IT superpower; Convert PCOs, wherever justified, into Public Tele-info centers having multimedia capability like Integrated Services Digital network (ISDN) services, remote database access, Government and community information systems etcetera.

5. Transform in a time bound manner, the telecommunications sector to a greater competitive environment in both urban and rural areas providing equal opportunity and level playing field for all players;

6. Strengthen Research and Development (R&D) efforts in the country and provide an impetus to build world-class manufacturing capabilities.

7. Achieve efficiency and transparency in spectrum management.

8. Protect the defense and security interests of the country.

9. Enable Indian telecom companies to become truly global players.

Effects of Telecom Policy Statements:-
The telecom reforms have yielded tangible results. The pictorial representation of the same is shown in the below given chart.
**Effects of Telecom Policy Statements**

<table>
<thead>
<tr>
<th>Factor</th>
<th>From</th>
<th>To</th>
</tr>
</thead>
<tbody>
<tr>
<td>Competition</td>
<td>• Monopoly service providers</td>
<td>• Competitive regime with multiple players (public and private sector) across service segments</td>
</tr>
<tr>
<td>Tariffs</td>
<td>• Peak long distance tariff from Delhi to Mumbai of Rs. 30 per minute</td>
<td>• Rs. 1.00 per minute</td>
</tr>
<tr>
<td></td>
<td>• Peak cellular outgoing tariff of Rs 16 per minute</td>
<td>• Rs. 1.00 per minute</td>
</tr>
<tr>
<td>Subscribers</td>
<td>• 18 million Fixed Line subscribers in March 1998.</td>
<td>• 49 million Fixed Line Subscribers (including Fixed Wireless Telephones and Limited mobility CDMA)</td>
</tr>
<tr>
<td></td>
<td>• Less than 1 million cellular subscribers in March 1998.</td>
<td>• 91 million mobile subscribers</td>
</tr>
<tr>
<td>Industry Size</td>
<td>• Total Industry revenue of US $ 4 billion in Financial Year 1998.</td>
<td>• US $ 18 billion for Financial Year 2005</td>
</tr>
<tr>
<td>Penetration</td>
<td>• Less than 2 per cent Telephone penetration in March 1998</td>
<td>• 12.5 per cent</td>
</tr>
<tr>
<td>Regulator</td>
<td>• No Regulator</td>
<td>• Independent and active Regulator (TRAI) and Appellate Tribunal (TDSAT)</td>
</tr>
</tbody>
</table>

(Source: M. Sahu, Reforms: Major Milestone, ASSOCHAM Telecom Conference, New Delhi, April 19, 2006)
The telecom reforms are the outcome of several initiatives taken by the Government in order to pass on the revolutionary benefits to all the stakeholders leading to the overall development of the nation. The major milestone of telecom reforms is shown in figure 1.3.

**Major Policy initiatives in telecom sector:**

- Detailed guidelines for a controlled, simultaneous, ascending e-auction for 3G and BWA service were announced on August 1, 2008. The allocation of spectrum for 3G will boost telecom sector.

- Telecom Centres of Excellence (TCOE) concept is being established in a public-private partnership (PPP) mode with all stakeholders onboard, to promote application oriented research and to assist and train high level decision makers to manage sector reforms and corporate managers to manage networks and services. There will be eight TCOEs at the premier academic institute of the country with seven major telecom operators supporting one centre each. The spectrum management centre is being developed in an autonomous model with the support of an industry consortium.

- To regulate unsolicited calls from telemarketers, a regulation has been implemented with a “National Do Not Call Registry (NDNC).” About 7.2 million subscribers have registered on the NDNC and there has been a substantial reduction in unsolicited calls.

- It has been decided that there should be no cap on the number of access providers in any service area.

- On March 3, 2008, selective roaming facility for pre-paid subscribers between Assam North-east and vice-versa were
permitted subject to certain conditions. On July 11, 2008, provision of mobile service within 500 meters of the international border within Indian Territory has been permitted.¹⁷

Fig. 1.1D

Reforms: Major Milestone

(Source: M. Sahu, Reforms: Major Milestone, ASSOCHAM Telecom conference New Delhi, April 19, 2006.)

TELECOM REGULATORY AUTHORITY OF INDIA

TRAI was established during the year 1997 in order to regulate the entire telecommunication sector in the country. It’s mission to create and nurture conditions for the growth of telecommunications including broadcasting and cable services in the country in a manner and at a palace, which will enable India to play a leading role in the merging global information society.

The main objectives of TRAI:-

➢ Transparency in decision-making by affording an opportunity to all stakeholders.

➢ Providing consumer with adequate choice, affordable tariffs and high quality of service.

➢ Promoting level playing field and fair competition among service providers.

➢ Access to world-class quality telecommunications, broadcasting and cable services

➢ Promoting efficiency in operations in all the tiers of the industry.

➢ Adoption of emerging technologies within the framework of technology neutral policy,

➢ Ensuring technical compatibility and effective inter-connection between service providers.
TRAI issues necessary regulations, directives, orders or guidelines from time to time to achieve the above objectives. It is concerned with the poor growth of telecommunication in rural areas. The authority had undertaken extensive consultation for proliferation of telecom services in rural areas, which will enable India to a leading role in the emerging Global information society. It had also forwarded its recommendations to government in October 2005. The mobile services hitherto were not covered under USO (Universal Services Obligation) schemes and therefore, Authority had proposed that the erection of mobile tower in rural areas should be supported from USO fund. Accordingly, India Telegraph (Amendment) Act 2003 was amended to extend support from USAO fund for erection of mobile towers in rural and remote areas. In addition to this authority has recommended infrastructure sharing which is critical for growth in rural areas. The government’s role in funding telecom infrastructure will be crucial to the growth and spread of telephony in rural India. About 8,000 telecom towers across the country at an estimated cost of INR 25,000 million have been planned; it will provide about 50 million mobile connections in rural India. Government is also planning for setting up additional 10,000 towers. A minimum of three operators have to share a tower, rural India will also have a choice of service providers.

The priority areas would be:

1. Improving the penetration of the telecom facilities including broadband access in the rural and far-flung areas.
2. Fulfilling subscribers demand for newer services and applications.
3. Improving the quality of service.
5. Consumer protection and privacy.

The following table captures few of the key regulatory changes that were implemented by the DOT / TRAI in 2005 – 06.

<table>
<thead>
<tr>
<th>Regulatory Development</th>
<th>Brief Comment</th>
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</table>
| Alteration of Interconnection usage (IUC) Regime.        | * Changes effective 1 March, 2006  
* On domestic calls, per minute ADC is replaced by a “revenue share ADC” wherein operators will pay 1.5% of their non-rural AGR to BSNL.  
* ADC on international call has been reduced.  
* Downward revision of tariffs. |
| Increase in foreign direct investment (FDI limit from 49% to 74%) | * On November 3, 2005, the government of India announced enhancement of FDI ceiling from 49% to 74% in the telecom sector, subject to certain preconditions. |
| Revised terms and condition of licenses.                 | * On November 11, 2005 the central government announced revised terms for NLD, ILD, ISPs, IPVPN and VSATs with a Decrease in license free for NLD/ILD licenses from 15% of AGR to 6% of AGR.  
* Revised norms provide considerable ease to new operators with the Lowering of entry barriers through reduced license free and roll out obligations. The one time entry free has been reduced to Rs. 250 million from Rs. 1,000 million. |
| Regulation on Code of Practice for metering and          | * Effective from March 21, 2006.  
* The regulation prescribes various |

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<table>
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<tr>
<th>Regulatory Development</th>
<th>Brief Comment</th>
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<tr>
<td>billing accuracy</td>
<td>measures to ensure that the customer gets complete information relating to his tariff Plan and charges for value-added services.</td>
</tr>
<tr>
<td>Regulation on Quality of Service (QoS) parameters of basic and cellular services</td>
<td>* Effective July 01, 2005.</td>
</tr>
</tbody>
</table>
| Amendment to Reporting System on Accounting Separation Regulation | * Effective March 27, 2006.  
* Restriction of applicability to only those service providers whose minimum turnover in the preceding financial year is Rs. 250 million |
| Amendment to telecom Tariff order 1999 and non-the life time. | * Corporate plans (for data) need not be disclosed to TRAI  
* All operators need to issue a periodic certificate of compliance with principles of non-discrimination predation.  
* Life time plans applicable only for remaining life of license to subscribers of the life time plan(s). Ni change in tariff would be permitted during the plan. |

**Social Responsibility of the Telecom Business Houses:**

Social responsibility is understood as the obligation of decision makers to take actions, which protect and improve the welfare of society as whole along with their own interests. A business house must earn profit first in order to satisfy its economic responsibilities. For existence and sustainability, it must fulfill legal responsibilities by following the laws. After these are met, the firm should seek to fulfill its social and ethical responsibilities.
A business house is meant for society and gaining benefits from the society. Telcos are no exceptions. Corporate houses have the obligation to incur their efforts for societal up-liftment in some specific areas as identified by them in the interest of overall human community.

COMMON CHARTER OF TELECOM SERVICES BY ALL SERVICE PROVIDERS

One of the main objectives of establishment of TRAI is to regulate the telecom services to protect the interests of service providers and the consumers of telecom sector.

TRAI, in consultation with various NGOs / Consumer Advocacy Groups (CAGs) and Telecom service providers has finalized a common charter for adoption by all telecom service providers. TRAI is of the opinion that this will help in protection of consumer interests as envisaged in the TRAI Act. The provisions in the commons charter are as follows:

1. All service providers acknowledge the rights of citizens to have a free choice in selecting their service providers and agree to promote their services in the best spirit of competition and traditions of service to consumers:

2. All service providers agree to promote the consumers’ right to education, choice, representation and redress;
3. All service providers assure that the privacy of their subscribers (not affecting the national security) shall be scrupulously guarded;

4. All service providers assure that their subscribers shall be entitled to interact with them, either personally or through their authorized representatives;

5. For information and education of subscribers, all service providers agree to inform their subscribers of the broad range of services offered, the individual plans available to them at any given point of time, the tariff rates applicable to each of these, their validity, terms and conditions, payment policies, the billing processes and procedures and the structure within the organization where information and clarification on consumer redress systems for complaints and billing disputes will be available with all their relevant contact numbers;

6. All service providers agree to arrange human interface with responsible company executives whose name and identity are made known during the process of disputes resolution in addition to arrangements like Customer Care Service through call centers;

7. All service providers agree to inform their subscribers on the reverse of each (clause 7 amended as agreed in the meeting of the CAGs and service providers held on 24th January 2006 so as to inform the subscribers through each bill instead of informing “periodically”) their consumer grievance redress process with respect to complaints and billing disputes. They also agree to
resolve the disputes as per the guidelines of TRAI issued from time to time.

8. All service providers agree to provide an applicant basic telephone connection within 7 days of registration, subject to technical feasibility and the mobile connection immediately subject to compliance of all required formalities by the subscriber;

9. All service providers agree to repaid the faults within 24 hours of receipt of complaint from a subscriber, wherever technically feasible;

10. All service providers agree to ensure shifting of telephone connection within 3 working days within the same exchange, 5 working days for intra city and 30 working days for inter city exchanges and closure (disconnection) of telephone connection within 3 days, on receipt of a letter of request from the subscriber. An authenticated copy of the last telephone bill shall accompany the letter of request.

11. All service providers agree to provide in their bills related call and tariff details, payment procedures and list of points at which payments can be made by subscribers. All service providers agree to register complaints in all areas of their service immediately, if delivered in person or by e-mail and within 24 hours on receipt of the complaint by post;

12. All service providers shall render service without discrimination to every citizen as per his eligibility defined below and who undertakes to pay all charges and deposits: “For
the purpose of this clause, a citizen shall be defined as an individual above the age of 18 or an institution, NGO or business / Service organization engaged in any activity which is permissible under the laws of the land”.

13. All service providers agree to provide information on Directory Service and book complaints on toll free number for registering complaints;

14. All service providers agree to provide their subscribers satisfactory connectivity to their service and interconnectivity to the extent of their respective legal obligation under the relevant interconnection agreement and to ensure that subscribers do not suffer on account of poor service;

15. All service providers agree to levy reconnection charges as per the TTO or waive the same on their won discretion;

16. All service providers agree to allow emergency services like police, fire and ambulance for a period of 15 days during which incoming facility is allowed, if technically feasible, even after the telephone connection is suspended;

17. The subscribers agree to clear all dues within the specified time;

18. All service providers agree to achieve the minimum benchmarks prescribed by TRAI with respect to the quality of service and also commit themselves to improve upon the standards of service at different points of time;
19. Mutual courtesy and respect are the hallmarks of any durable relationship between the service providers and subscribers and both agree to abide by these principles.

The service providers agree to strive for adhering to all the points contained in this charter and to make every effort to abide by the charter.

UNSOLICITED CALLS:

The services are so complex and wide that the unknown forces may drive the teens, adults and the old to make calls to friendship lines, astrological line and then land in the trouble of hefty bills as these services are premier services. The short messaging services (SMS) and Multimedia messaging service (MMS) mania may divert the attention and lead to unwarranted situations especially among the student community. This is the reason that many education institutions have banned the usage of mobile phones in the campuses. Whispering talks and the like may lead to misunderstandings as well. The unsolicited calls from tele-malls, credit card franchisees and the like invade privacy of the consumers.

Telephone users, who have been receiving unsolicited and intrusive calls and SMS messages from insensitive advertisers, may at last heave a sigh of relief. Telecom Regulatory Authority of India (TRAI), has announced that regulations end the menace of unsolicited calls, SMS messages and other forms of unwelcome intrusion into the privacy of telephone users.
The telecom revolution, which has evolved over a period of about a decade, now has been felt in tangible ways and means in the society. The societal concepts of communication have brought in the positive and negative but untold side of the transformation which is discussed in brief as below:-

**Psychological implications:**

The services are closely related to psychological effects. The ease of lifestyle is felt since communication is instant from anywhere to anywhere. The time wasting journeys, sudden arrival of guests at home or office is avoided. However, if phone calls are missing established communications patterns are impaired among the groups or between husband-wife, between friends, between any two attached acquaintances there are chances of thinking otherwise leading to misunderstandings. The lack of communication for any reason brings in tension while the other to communicate has conveniently forgotten to communicate. Wrong communications in SMS and MMS category also lead to misunderstandings.

**THEFT AND CRIME:**

Cloning of mobile phones is one of the latest crimes to hit mobile phone users. In cloning, an exact duplicate is made of any legitimate subscriber’s mobile and while calls are made from the clones’ phone, it is the legitimate subscriber who gets the bill for the calls made form the clones’ phone. Police say cloning has been made easy by software available freely on the Internet. All it needs is copying the Electronic Serial or ESN, and MIN or mobile
identification number onto a handset to create its clone. Now police are asking for greater awareness among users of their mobile’s ESN and MIN numbers, so that next time they find something heavy in their mobile bills they know someone somewhere has latched on their connection.

USE OF GLOBAL POSITIONING SYSTEM (GPS):

The Bangalore police are working on a new system that will reduce the time they take to arrive at the crime scene. They are now installing a SPS, which will enable the exact location of the call to be displayed on the digital map of the city. The operator will then be able to zoom in on the map and help guide the patrol vehicle to the exact location of crisis in record time. The service providers are responsible to check their processes and draw up strategies and fool proof methodologies for verifying the bona fide credibility of consumers, usage patterns of the telecom service provided to them and monitor for all the possible types of frauds in the overall interest of the society.

CRITICAL EXAMINATION OF THE GROWTH OF THE TELECOM SECTOR

Healthy comment often guides the growth and improvement in any sector. Many time, the solution and problems to together in such articles, such pieces of information, research papers, articles, speeches and the like are more common in the growing telecom sector. India being a price sensitive market and with the increasing awareness of global standards for services, the critical examination of the teleom
sector mostly relates the price and services with respects to common man’s perspective.

Lowest tariff in the world is nothing to cheer about, because everyone knows that monthly charges have actually increased. Providers have found ways of fattening their coffees by charging for unwanted service. Examples abound: SMS undelivered or sent to invalid numbers gets charged. Several times due to congestion or a shortcoming in the network, the call drops, even when it is connected. Adding insult to injury, consumers are charged for these short duration calls for no fault on their part. Similar practices lead to huge bills, in contrast to what are expected on the basis of simply, low tariff rates. Early 2008, through common charter of telecom services, operators agreed to achieve the minimum prescribed quality of service benchmarks, faced with high standards, they are now lobbying of lowering them. This clearly highlights the gap between intent and practice. TRAI should be enabled to impose penalty for non compliance.

Therefore, the services providers must constantly put efforts to have analysis of intra and inter parameters that affect the service quality and always tend towards continuous improvement towards perfection as a journey.

TECHNOLOGICAL IMPLICATIONS ON TELECOM SECTOR

For the first time in the history of man-kind, all information generated any where in the world in any form, that is voice, image and text can be instantaneously available to any person over tele-
communication network through various devices. Obviously, those who have the appropriate devices can seek information from anywhere in the world. Telecom, computers and internet technologies are thus opening up the possibility of equal opportunity for every human being to gain access to every time of information, everywhere in the world.

Innovations, creativity and application of new knowledge in the telecom sector through vibrant Research and Development (R&D) activity across the world have far reaching consequences to the customer, government, service providers, investors and the general public. The reach, connectivity, networking with the use of the cutting edge technology in the sector has enhanced phenomenally. In India, in the post liberalization era, the information technology (IT) wave is hard hitting in the areas of every sector of economy.

To facilitate the reach of latest technology, the role of operator in bringing the same to reach the consumer is very important. This is where we need to operate and see that the benefits reach the consumers.

The advancement in telecom technology has created awareness among the consumers about the instant connectivity anytime anywhere. The global concepts of business dynamics expect that the service providers take pains to optimize their resources to the latest technological updates to give ubiquitous connectivity at affordable and competitive price structure. This requires the telecom networking in a very efficient and unambiguous way with abundant bandwidth to
accommodate the growing and instant demands from consumers. Therefore it is very evident that a consortium and association formation is the inevitable part of the sector. The service providers are therefore, required to exhibit the united efforts in building a strong back-end-network. The opportunities are tapped here for sharing the basic infrastructure like power, towers, buildings, and space etcetera. Government of India is framing a new telecom policy where the infrastructure sharing coming into prime clauses for the benefit of all.

TELECOM IN URBAN AND RURAL INDIA – AN INSIGHT

The incumbent operator has built a strong infrastructure throughout the country. However, the growth was slow because of closed economic policies. With the opening up of the sector and announcement of new telecom policies, the private players have entered the market. The operators were much concerned about business decisions and, therefore, the concentration was more on urban areas where the usage of the services and the Average Revenue Per user (ARPU) was high. With this phenomenon, a vast rural market was left untapped. So, the government has to interfere with formulation of polices for the growth of telecom in rural areas.

Rural Telecom Growth – Universal Service Obligation (USO)

The Government is committed to provide access to all people for basic telecom services at affordable and reasonable prices. The resources for meeting the USO would be raised through a 'universal
access levy' that would all the operators under various licenses earn a percentage of the revenue.

Table: 1.7

USO Funds: Collection and Disbursements

(Rs. Crore)

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<tbody>
<tr>
<td>Collections</td>
<td>2143.2</td>
<td>3457.7</td>
<td>3533.3</td>
<td>4211.1</td>
<td>5405.5</td>
<td>-</td>
<td>20404.4</td>
</tr>
<tr>
<td>Disbursements</td>
<td>200.0</td>
<td>1314.6</td>
<td>1766.9</td>
<td>1500.0</td>
<td>1290.0</td>
<td>655.9</td>
<td>7027.3</td>
</tr>
</tbody>
</table>

Source: Department of Telecommunications.

Under the Bharat Nirman Programme, it will be ensured that 66,822 revenue villages in the country, which have not yet been provided with a Village Public Telephone (VPT), Shall be covered by November 2007. Out of the above villages, connectivity in 14,183 remote and far-flung villages will be provided through digital satellite phone terminals. Assistance for both capital as well as operational expenditure for these VPTs will be met out of the Universal Services Obligations Fund (USOF).

The above paragraphs clearly depict the government’s inclination to cover the rural India for telecom services. A great opportunity exists for the service providers to plan and implement their strategies for extending world-class services to the rural sector utilizing and bargaining with the Government for their telecom service needs to be on the win-win situation. In the offing telecom policy 2005, perhaps the beneficial features may come out to meet the challenges and tap the opportunities.

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The present Universal Services Obligation policy would result in rural teledensity targets of 4 per cent by 2010 even after giving subsidy support of rupees 30,000 crore. Therefore, there is clearly a need for re-look at our traditional policies regarding the communication needs of rural areas.

INDICATORS OF TELECOM GROWTH IN INDIA

India has been able to provide state of art world-class telecom infrastructure at globally competitive tariffs and to reduce digital divide by extending connectivity to the unconnected areas. Renowned telecom companies are setting up their manufacturing bases in India. Mobile telephone has now become the highest selling consumer good. A glimpse in the growth of telephone in tabular form is shown in the below:

**Telecom Reforms and growth Opportunities**

<table>
<thead>
<tr>
<th>Reforms</th>
<th>Growth and Opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1991-Mobile sector opened to private participation (Metros)</td>
<td>150 million telephone subscribers 75 million new subscribers added in the last two years</td>
</tr>
<tr>
<td>1994-Mobile (circles) and Basic services opened up</td>
<td>About 5 million subscribers being added every month since December 2005</td>
</tr>
<tr>
<td>1997-TRAI formed</td>
<td>Highest growth rate in the world, for the first time surpassing China</td>
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<tr>
<td>1999-Migration to revenue share</td>
<td>This growth has facilitated the expansion of BPO industry which employs 5 lakh people 400 employees added per day</td>
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<tr>
<td>2000-Formation of BSNL NLD sector opened up</td>
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<tr>
<td>Reforms</td>
<td>Growth and Opportunities</td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>2002 – BSNL launches nation-wide cellular services, ILD sector opened up</td>
<td>45 MHz of additional spectrum from defense to be made available for growth of mobile services in the beginning of the year 2007. GSM Spectrum between 15 MHz and 37 MHz allotted in different service areas.</td>
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<tr>
<td>2003 – Calling party pays introduced Unified access license introduced.</td>
<td>CDMA spectrum between 2.5 Mz and 15 MHz allotted in different service areas. Nokia, LG, Ericsson have set up their manufacturing facilities in India.</td>
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<tr>
<td>2004 – Rationalization and further reduction of license fees, Broadband policy announced.</td>
<td>Motorola, Foxconn, Aspocomn etcetera, have also decided to set up their manufacturing base with an investment of about US$ 650 million FDI of US$ 2 billion in telecom manufacturing by 2007.</td>
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<tr>
<td>2006 – One India introduced, ADC regime changed to revenue sharing</td>
<td>Handset for Rs. 1,500 launched, expected to go further down to Rs.1,000. -250 million telephone connections by 2007 taking the tele-density to 22 - Targets translate into an investment requirement of US$ 15 billion.</td>
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<td></td>
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<tr>
<td>2007</td>
<td>-Revenue of Rs. 10,50,000 million at 350 ARPU telephone connections expected to be 500 million telephones. - Requirement of additional investment about US$ 25 billion - Revenue of Rs. 21,00,000 million</td>
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<tr>
<td>2010</td>
<td>- Telephone connections would be about 800 million</td>
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<tr>
<td>Reforms</td>
<td>Growth and Opportunities</td>
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<tr>
<td>2015</td>
<td>- Additional investment would be about US$ 30 billion</td>
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<tr>
<td></td>
<td>- Revenue of Rs. 33,60,000 million</td>
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</table>


The above paragraphs show that the sector is booming in the post reform era and is continuing to grow. Organization success in today's competitive context to a great extent relies on telecom utility.

**CONCLUSION**

It is clear from the foregone analysis that the Indian telecom industry has evolved as one of the fastest growing sectors in the country with a network of more than 653 million connections (including wireless and wire line has really brought many challenges in its wake on the consumer services front. Telecom has completely shaken the way of communicating among the masses and corporate sector. The process of globalization is facilitated by communication through interconnectivity networking and the speed with which information is flooding.

The concept of globalization, liberalization and privatization are more pronounced in the telecom sector of our country. The speed with which changes that is taking place in the sector is inexplicable. The increased cellular services and their accessibility even in rural areas has brought a revolutionary change and affected even the GDP growth rate of the economy.

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