CHAPTER-2

INDIAN TELECOM SECTOR - AN OVERVIEW

2.1 History:

The journey of this sector starts with telegraph and telephone. The first Director General was Dr. William O Shanghessy. On 1.4.1950, 196 telephone exchanges were absorbed from princely states. The installed capacity of 196 exchanges was 13, 362 lines with 11,296 working connections. From 1984, postal, telegraph and telephone services were managed by the Post and Telegraph Department up to 31st December. Later, in January 1985 two separate departments were created for posts and telecommunications. In 1986 the department recognized the telecommunication circles with secondary switching areas as basic units. In the year 1989, the Telecom Commission was constituted.

2.2 Highlights of Indian telecom phases

Phase-1 ➔ Pre – liberalization era (1980-89)

- Entry of private sector into telecommunications equipment manufacturing – 1984
- Formation of Mahanagar Telephone Nigam Limited (MTNL) and Videsh Sanchar Nigam Limited (VSNL) – 1986
- Telecom Commission was setup - 1986

Phase -2 ➔ Post – liberalization (1990-99)

- Liberalization of Indian economy – 1990’s
- Private sector participation in the provision of VAS such as cellular and paging services – 1992
- National Telecom Policy announced – 1994
- Telecom Regulatory Authority of India (TRAI) was established in 1997
- New Telecom Policy (NTP) announced – 1999
Phase -3 ➔ Post 2000

- Bharat Sanchar Nigam Limited (BSNL) established – 2000
- National long distance (NLD) and international long distance services opened to competition – 2000
- CDMA technology launched – 2000
- International telephony initiated- 2000
- Reduction of license fees – 2000
- VSNL privatized – 2002
- Launch of mobile service by BSNL – 2002
- Unified Access Licensing (UASL) regime was introduced – 2003
- Calling Party Pays (CPP) was implemented – 2003
- Broad policy was formulated – 2004
- Intra circle merger guidelines established – 2004
- FDI limits increased from 49% to 74% - 2005
- Number portability was proposed – 2006

2.3 Telecom Regulatory Authority of India – TRAI

It was established on February 20, 1997 by an act of parliament to regulate telecom services and tariffs in India. TRAI’s mission is to create and nurture conditions for growth of telecommunications in India to enable the country to have a leading role in the emerging global information society. TRAI is administered through a secretariat headed by the secretary assisted by advisors. All proposals are processed by the secretary, who organizes the agenda for authority meetings (consulting the chairman), prepares the minutes and issues regulations in accordance with the meetings. These include mobile network, interconnections and fixed network, broadband, policy analysis, quality of service, broadcasting and cable services, economic regulations, financial analysis, consumer affairs and international relations. Officers are selected from the premier Indian Telecommunications Service and also from the Indian Administrative Service. One of its main objectives is to provide a fair and
transparent environment that promotes a level playing field and facilitates fair competition in the market. TRAI regularly issues orders and directions on various subjects such as tariffs, inter connections, direct to home (DTH) services and mobile number portability. In January 2000, TRAI decided to establish the Telecom Disputes Settlement Appellate Tribunal (TDSAT) to take over the adjudicatory functions of the TRAI. The TDSAT was set up to resolve any dispute between a licensor and a licensee, between two or more service providers, between a service provider and a group of consumers. In addition, TRAI orders or decisions can be challenged by appealing to TDSAT.

2.4 National Telecom Policy-1999

The major objectives of National Telecom Policy are

- Availability of affordable and effective communications for the citizens-Core vision and goal of the telecom policy.
- Balance between universal service to all uncovered areas, including the rural areas, and high level services capable of meeting the needs of the country’s economy.
- Development of telecommunication facilities in remote, hilly and tribal areas of the country.
- Creation of modern and efficient telecommunications infrastructure taking into account the convergence of IT, media, telecom and consumer electronics, and thereby becoming an IT super power.
- Conversion of PCOs, wherever justified, into public Tele Info Centers having multi-media capability like, ISDN services, remote database access, government and community information systems etc.
- Transformation in a time bound manner, the telecommunications sector to a greater competitive environment in both urban and rural areas providing equal opportunities and level playing field for all players.
- Strengthening of research and development efforts in the country and provision of an impetusto build world-class manufacturing capabilities.
- Achievement of efficiency and transparency in spectrum management.
- Protection the defense and security interests of the country.
Enabling Indian Telecom companies to become truly global players.

2.5 National Telecom Policy – 2012

The policy was introduced to underscore the imperative that sustained adoption of technology would offer viable options in overcoming developmental challenges in education, healthcare, employment generation, financial inclusion and much else.

2.5.1 Objectives of the policy are as follow:

1. Provide secure, affordable and high quality telecommunication services to all citizens.
2. **Increase rural teledensity from the current level of around 39% to 70% by the year 2017 and 100% by the year 2020.**
3. Provide affordable and reliable broadband-on-demand by the year 2015 and **achieve 175 million broadband connections by the year 2017 and 600 million by the year 2020 at minimum of 2 Mbps download speed and make available higher speeds of at least 100 Mbps on demand.**
4. Enable citizens to participate in and contribute to e-governance in key sectors like healthcare, education, skill development, employment, governance, banking etc. to ensure equitable and inclusive growth.
5. **Provide high speed and high quality broadband access to all village panchayats through a combination of technologies by the year 2014 and progressively to all the villages and habitations by 2020.**
6. **Promote innovation, indigenous R&D and manufacturing** to serve domestic and global markets, by increasing skills and competencies.
7. **Create a corpus to promote indigenous R&D, IPR creation, entrepreneurship, manufacturing, commercialization and deployment of state-of-the-art telecom products and services during the 12th five year plan period.**
8. Promote the ecosystem for design, Research and Development, IPR creation, testing, standardization and manufacturing i.e. complete value chain for domestic production of telecommunication equipment to **meet Indian telecom sector demand to the extent of 60% and 80% with a minimum value addition of 45% and 65% by the year 2017 and 2020 respectively.**
9. Provide preference to domestically manufactured telecommunication products, in procurement of those telecommunication products which have security implications for the country and in Government procurement for its own use, consistent with our World Trade Organization (WTO) commitments.

10. Develop and establish standards to meet national requirements, generate IPRs, and participate in international standardization bodies to contribute in formulation of global standards, thereby making India a leading nation in the area of international telecom standardization. This will be supported by establishing appropriate linkages with industry, R&D institutions, academia, telecom service providers and users.

11. Simplify the licensing framework to further extend converged high quality services across the nation including rural and remote areas. This will not cover content regulation.

12. Strive to create One Nation - One License across services and service areas.

13. Achieve One Nation - Full Mobile Number Portability and work towards One Nation - Free Roaming.

14. Reposition the mobile phone from a mere communication device to an instrument of empowerment that combines communication with proof of identity, fully securefinancial and other transaction capability, multi-lingual services and a whole range of other capabilities that ride on them and transcend the literacy barrier.

15. Encourage development of mobile phones based on open platform standards.

16. Deliver high quality seamless voice, data, multimedia and broadcasting services on converged networks for enhanced service delivery to provide superior experience to users.

17. Put in place a simplified Merger & Acquisition regime in telecom service sector while ensuring adequate competition.

18. Optimize delivery of services to consumers irrespective of their devices or locations by Fixed-Mobile Convergence thus making available valuable spectrum for other wireless services.

19. Promote an ecosystem for participants in VAS industry value chain to make India a global hub for Value Added Services (VAS).
20. Ensure adequate availability of spectrum and its allocation in a transparent manner through market related processes. Make available additional 300 MHz spectrum for IMT services by the year 2017 and another 200 MHz by 2020.

21. Promote efficient use of spectrum with provision of regular audit of spectrum usage.

22. De-license additional frequency bands for public use.

23. Recognize telecom as Infrastructure Sector to realize true potential of ICT for development.

24. Address the Right of Way (RoW) issues in setting up of telecom infrastructure.

25. Mandate an ecosystem to ensure setting up of a common platform for interconnection of various networks for providing non-exclusive and non-discriminatory access.

2.6 National Long Distance

The government announced, on 13.8.2000, the guidelines for entry of private sector in National Long Distance services without any restriction on the number of operators. The DOT guidelines of license for the National long distance operators were also issued.

2.7 NLD guidelines:

- Unlimited entry for carrying both inter-circle and intra-circle calls.
- Total foreign equity (including equity of NRIs and international funding agencies) must exceed 74%. Promoters must have a combined net worth of Rs. 25 million.
- Private operators will have to enter into an arrangement with fixed-service providers within a circle for long-distance and short-distance traffic changing centers.
- Seven years time frame set for rollout of network. Spread over four phases any shortfall in network coverage would result in encashment and forfeiture of bank guarantee of that phase.
Private operators will have to pay one-time entry fee of Rs.25 million plus a Financial Bank Guarantee (FBG) of Rs. 200 million. The revenue sharing agreement would be to the extent of 6%.

Private operators are allowed setting up landing facilities that access submarine cables and use excess bandwidth available.

License period would be for 20 years and extendable by 10 years.

2.8 International Long Distance

In the field of international telephony, India had agreed under the GATS to review its opening up in 2004. However, open competition in this sector was allowed with effect from April 2002 itself. There is no limit on the number of service providers in this sector. The license for ILD service is issued initially for a period of 20 years, with automatic extension of the license by a period of 5 years. The applicant company pays one-time non-refundable entry fee of Rs. 25 million plus a bank guarantee of Rs. 250 million, which will be released on fulfillment of the roll out obligations. The annual license fee including USO contribution is 6% of the adjusted gross revenue and the fee/royalty for the use of spectrum and possession of wireless telegraphy equipment are payable separately.

2.9 Unified Access Services

Unified access license regime was introduced in November 2003. Unified Access Services operators are free to provide, within their area of operation, services, which cover collection, carriage, transmission and delivery of voice and no-voice messages over licensees’ network by deploying circuit and/ or packet switched equipment. Further, the licensee can also provide voice mail, audio text services, video conferencing, video text, E-mail, closed user group(CUG) as value added services over network to the subscribers falling within its service area on non-discriminatory basis. The country is divided into 23 service areas consisting 19 telecom circles and 4 metro service areas for providing Unified Access Service (UAS). The license for unified access services will be issued on non-exclusive basis, for a period of 20 years, extendable by 10 years at one time within the territorial jurisdiction of a licensed service area. The license fee is 10%, 8% and 6% of adjusted gross revenue (AGR) for metro and category ‘A’, category B and category C service
area respectively. Revenue and the fee/royalty for the use of spectrum and possession of wireless telegraph equipment are payable separately. The frequencies are assigned by WPC wing of the department of telecommunications from the frequency bands earmarked in the applicable national frequency allocation plan and in coordination with various users subject to availability of scarce spectrum.

2.10 Broad Band Policy 2004

Government announced broad band policy in October 2004. The main emphasis is on the creation of infrastructure through various technologies that can contribute to the growth of broad band services. These technologies include optical fiber, Asymmetric Digital Subscriber Lines (ADSL), cable TV network; DTH etc. Primary objective of the policy was to maintain affordability and reliability of broad band services, incentives for creation of additional infrastructure, employment opportunities, introduce of latest technologies, protect national security and bring in competitive environment so as to reduce regulatory interventions. From this new policy, the government intends to make available transponder capacity for VAST services at competitive rates after taking into consideration the security requirements. The service providers are permitted to enter into franchisee agreement with cable TV network operators. However, the licensee shall be responsible for compliance of the terms and conditions of the license. Further, in the case of DTH services, the service providers are permitted to provide Receive – only – Internet service. The role of electricity authorities, departments of I T of various state governments, department of Local self government and panchayats, departments of health and family welfare, department of education is very important to carry the advantage of broad band services to the users, particularly in rural areas.

2.11 Telecom Commission

It was set up by the Government of India with vide Resolution dated April 11, 1989 with administrative and financial powers to deal with various aspects of Telecommunication. Presently, the Telecom Commission consists of a Chairman, four full-time Members, who are ex-officio Secretaries to the Government of India in the Department of Telecommunication and four part-time Members who are the Secretaries to the Government of India of the concerned Departments. The Secretary
to the Government of India in the Department of Telecommunication is the ex-officio Chairman of the Telecom Commission. The full-time Members of the Telecom Commission are Member (Finance), Member (Production), Member (Services) & Member (Technology). The part-time Members of the Telecom Commission are Secretary (Department of Economic Affairs), Secretary (Department of Electronics & Information Technology), Secretary (Department of Industrial Policy & Promotion) and Chief Executive Officer, NITI (National Institution for Transforming India) Aayog.

The responsibilities of the commission:

- Formulating the policy of Department of Telecommunication for approval by the Government
- Preparing the budget for the Department of Telecommunication for each financial year and getting it approved by the Government and
- Implementation of Government’s policy in all matters concerning telecommunication.

2.12 Department of Telecommunication

It is responsible for Policy Formulation, Performance Review, Monitoring International Cooperation and Research & Development in the field of Telecommunication. The Department also allocates frequency and manages radio communications in close coordination with the international bodies. It is also responsible for enforcing wireless regulatory measures and monitoring the wireless transmission of all users in the country. Universal Service Obligation (USO) Fund had been set up on June 1, 2002 for the purpose of implementation of Universal Service Support Policy.

After formation of Bharat Sanchar Nigam Ltd (BSNL) in October, 2000, following are the functions assigned to the DoT under Government of India (Allocation of Business), Rules, 1961.

- Policy, Licensing and coordination matters relating to Telegraphs, Telephones, Wireless, Data, Fascimile, Telematic services and other forms of communication.
• International cooperation in matters connected with telecommunications including matters relating to all international bodies dealing with telecommunications such as International Telecommunication Union (ITU), its Radio Regulation Board (RRB), Radio Communication Sector (ITU-R), Telecommunication Standardization Sector (ITU-T), Development Sector (ITU-D), International Telecommunication Satellite Organization (INTELSAT), International Mobile Satellite Organization (INMARSAT), Asia Pacific Telecommunication (APT).

• Promotion of standardization, research and development in telecommunications.

• Promotion of private investment in telecommunications.

• Financial assistance for the furtherance of research and study in telecommunications technology and for building up adequately trained manpower for telecom program, including:
  ➢ Assistance to institutions, scientific institutions and universities for advanced scientific study and research; and
  ➢ Grant of scholarships to students in educational institutions and other forms of financial aid to individuals including those going abroad for studies in the field of telecommunications.

• Telecom Commission

• Telecom Regulatory Authority of India.

• Telecom Disputes Settlement and Appellate Tribunal.

• Administration of laws with respect to any of the matters specified in this list, namely:-
  ➢ The Indian Telegraph Act, 1885 (13 of 1885)
  ➢ The Indian Wireless Telegraphy Act, 1933 (17 of 1933) and the Telecom Regulatory Authority of India Act, 1997 (24 of 1997)

• Indian Telephone Industries Limited.

• Post disinvestment matters relating to M/s Hindustan Tele-printers Limited.

• Bharat Sanchar Nigam Limited.

• Mahanagar Telephone Nigam Limited
• Bharat Broadband Network Limited (BBNL)
• Tata Communications Limited (TCL) and Telecommunication Consultants (India) Limited
• Hemisphere Properties India Limited (HPIL)
• All matters relating to Centre for Development of Telematics (C-DOT).
• Residual work relating to the erstwhile Department of Telecom Services and Department of Telecom Operations, including matters relating to:
  ➢ Cadre control functions of Group ‘A’ and other categories of personnel till their absorption in Bharat Sanchar Nigam Limited
  ➢ Administration and payment of terminal benefits.
• Execution of works, purchasing and acquisition of land debit able to the capital budget pertaining to telecommunication.

2.13 Current market situation

At present the number of telephones has increased from 996.13 million in the beginning of the financial year to 1036.57 million telephone connections, including 1011.05 million wireless telephone connections. The share of wireless telephones in total is 97.54%. Overall tele-density in the country is 81.85%. The urban tele-density is 152.57% whereas rural tele-density is 49.82%. The share of private sector in total is 89.88%. The number of Broadband connections is 131.49 million at the end of November, 2015

2.13.1 Wire Line And Wireless Service Connection

The landline telephone connections are now 25.52 million and the number of wireless telephone connections has grown to 1011.05 million at the end of December, 2015. As a result, the share of wireless telephones increased to 97.54% of total services. The ever-expanding demand for wireless services has propelled the telecom sector to create sustainable resources to meet such requirements.

2.13.2 Public Vs Private

At the end of December, 2015, the total number of telephone connections provided by the private sector increased to 931.63 million and the number of telephone connections provided by the public sector stood at 104.94 million. The
share of private sector in the total number of connections increased to 89.88% at the end of December, 2015, over public sector share of 10.12% during the same period.

2.13.3 Tele-Density

It denotes the number of telephones per 100 population and is an important indicator of telecom penetration in any country. Tele-density in India was 79.36% as on April 1, 2015 and increased to 81.85% at the end of December, 2015.

The rural tele-density increased from 48.04% to 49.82% per cent during this period. Urban tele-density, maintained its upward trend (higher than the rural tele-density) by growing from 149.04% to 152.57% during this period.

Amongst the Service Areas, Himachal Pradesh (124.54%) had the highest tele-density followed by, Tamil Nadu (117.27%), Punjab (104.15%), Karnataka (102.33%) and Kerala (100.52%). On the other hand, the Service Areas such as Bihar (52.55%), Assam (55.22%), West Bengal (61.40%), Madhya Pradesh (63.07%), Uttar Pradesh (63.51%) and Odisha (65.69%) have comparatively low tele-density. Amongst the three metros of Delhi, Kolkata and Mumbai, Delhi Service Area tops in tele-density with 240.93% tele-density, followed by Kolkata (160.30%) and Mumbai (149.45%).

2.13.4 Foreign Direct Investment Policy

The government raised FDI limit for the telecom services from 74 per cent to 100 per cent. This measure facilitates telecom licensees to consolidate equity and raise domestic as well as foreign debt from the market. Telecommunication and telecom services have been included under the Harmonized Master list of infrastructure sub-sector and qualify for infrastructure lending. Reserve Bank of India has also expanded the existing definition for infrastructure sector for the purpose of availing External Commercial Borrowing (ECB).

2.13.5 Universal Service Obligation Fund

The Government, in June 2002, had established Universal Service Obligation Fund (USOF) by an Act of Parliament. Subsequently, the scope of USOF was widened to provide subsidy for enabling access to all types of telegraph services
including mobile services, broadband connectivity and creation of infrastructure like optical fiber in rural and remote areas. Therefore, various schemes have been launched by USOF for provision of telecom services in rural and remote areas of the country. The Fund Balance is `41834.10 crore as on December 31, 2015 with resources raised via universal levy to the tune of `70120.03 crore out of which an amount of `21337.29 crore has been disbursed as subsidy support so far.

2.13.6 Bharatnet

The optical fiber has predominantly reached state capitals, districts and blocks to connect all 2.5 lakh Gram Panchayats in the country. The Government approved a project called

‘National Optical Fiber Network (NOFN)’, now known as BharatNet. Non-discriminatory access to the network will be provided to all the telecom service providers like mobile, internet and cable TV in rural areas. The project is being executed by a Special Purpose Vehicle (SPV), namely, Bharat Broadband Networks Limited (BBNL). Under this project, up to December 31, 2015 -1, 11,645 km of pipes and 82,501 km of optical fiber cables have been laid in the country. Further, the number of Gram Panchayats which OFC has connected is 34,881.

2.13.7 Rural Wire-Line Broadband Scheme

For providing wire-line broadband connectivity up-to village level in rural and remote areas, USOF signed an agreement with BSNL under the Rural Wire-line Broadband Scheme to provide wire-line broadband connectivity to rural and remote areas by leveraging the existing rural exchanges infrastructure and copper wire-line network. The speed of each of the broadband connections shall be at least 512 Kbps. It is estimated that there are about 55,669 villages in the country that do not have mobile coverage. Providing mobile coverage to the 8621 uncovered villages in the North Eastern Region (NER) has been included as part of the Comprehensive Telecom Development Plan for NER.
2.13.8 Regulatory Framework

The Telecom Regulatory Authority of India (TRAI) has always endeavored to encourage greater competition in the telecom sector together with better quality and affordable prices in order to meet the objectives of National Telecom Policy (NTP) - 2012. A number of recommendations on various telecom issues were made by TRAI during 2015-16. TRAI has also taken steps to ensure the quality of service provided by the service providers by way of monitoring the performance of Basic and Cellular Mobile Telephone Service on quarterly basis and Point of Interconnection (POI) congestion on monthly basis. The regulatory measures taken by TRAI facilitate orderly growth of telecom sector by promoting healthy competition and enhancing investment efficiency besides protecting the interest of consumers.

2.13.9 Implementation of Full Mobile Number Portability

Mobile Number Portability (MNP) allows subscribers to retain their existing telephone number when they switch from one access service provider to another irrespective of mobile technology or from one technology to another of the same or any other access service provider. The government has announced the guidelines for Mobile Number Portability (MNP) service license in the country on 1st August 2008. The Department of Telecom carried out necessary amendment to Mobile Number Portability license conditions and other instructions in accordance with the recommendations of TRAI. Accordingly, the acceptance testing of telecom networks was carried out successfully. The facility of Full Mobile Number Portability had been implemented on July 3, 2015 in the country.

2.13.10 Licensing for National Long Distance (NLD) and International Long Distance (ILD) Services

After announcing opening up of International Long Distance (ILD) Service in April, 2002 and

National Long Distance (NLD) Service in August, 2002 for free competition, the Government has so far issued 27 ILD Licenses and 34 NLD Licenses (including BSNL). After the introduction of Unified Licensing Regime, the new licenses to operate NLD and ILD services are being given as authorization under Unified
License. Under Unified Licensing (UL) regime, in addition to above mentioned licenses, five licensees have been authorized to offer ILD services and seven licensees have been authorized to offer NLD services. The Net worth and paid up capital requirement for obtaining NLD and ILD service authorization under Unified Licensing (UL) regime for the applicant company is `2.50 Crore each. The annual license fee for NLD as well as ILD Service has been enhanced to 8% (inclusive of USO contribution) of the Adjusted Gross Revenue w.e.f. April, 2013.

2.13.11 Internet and Broadband Services

As per guidelines for grant of Unified License dated 19th August 2013, the internet services have been included in the Unified License. Accordingly, with effect from August 19, 2013, Unified License with ISP authorization is granted for provision of internet services. As on December 31, 2015, there are 323 authorized Licensees for Internet Services which include 82 Category “A” Licensees, 135 Category “B” Licensees and 106 Category “C” Licensees. Further, as on December 31, 2015, 313 Unified Licenses have been issued with ISP authorization. This includes 21 Category ‘A’ ISP authorizations, 144 Category ‘B’ ISP authorizations and 148 Category ‘C’ ISP authorizations. As on September 30, 2015, there were about 324.95 million internet subscribers including 120.88 million Broadband subscribers.

2.13.12 Centre For Development Of Telematics (C-Dot)

C-DOT is Department of Telecom’s R&D centre. It is committed to providing a wide range of cost-effective, indigenously developed and state-of-the-art total telecom solutions. Starting from the single mission of providing a dial tone, C-DOT has grown to the level of a national centre for Research and Development in the cutting-edge state-of-the art technology to fulfill the needs of communication technologies in the areas – Optical (optical transport, GPON), router & switches (terabit capacity router, L2/L3 switches), next generation network (voice-over-IP), wireless technology (WiFi, 2G, 4G mobile), satellite communications, interception & monitoring, telecom services & applications (network management, Gyansetu for rural), etc.
2.13.13 Public Sector Undertakings

Department of Telecom has the following PSUs under its administrative control:

a) Bharat Sanchar Nigam Limited (BSNL)
b) Mahanagar Telephone Nigam Limited (MTNL)
c) ITI Limited
d) Telecommunications Consultants India Limited (TCIL)
e) Bharat Broadband Network Limited (BBNL)
f) Hemisphere Properties India Limited (HPIL)

2.13.14 Research & Development

C-DOT is an autonomous body and DoT’s R&D arm. The organization is committed to providing a wide range of cost-effective, indigenously developed and state-of-the-art total telecom solutions. C-DOT has grown to the level of a national centre for R&D in communication technology in many areas – Satellite communications, IN, ATM, DWDM, NMS, Wireless Broadband, GPON, NGN and Mobile Cellular systems. C-DOT is also entrusted with the projects of national importance, like Central Monitoring System for telecom security and Secure Network for strategic applications.

2.14 Major players of Indian telecom sector-

- Bharath Sanchar Nigham Limited:

The Bharath Sanchar Nigham Limited is an Indian state-owned telecommunication company headquartered in New Delhi, India. It was incorporated on 15th Sep 2000. It took over the business of providing telecom services and network management from the erstwhile central government departments of telecom services (DTS) and telecom operations (DTO) with effect from 1st Oct 2000. It is the largest mobile telephony provider in India, and is also a provider of broadband services. However, in recent years the company’s revenue and market share plunged into heavy losses due to intense competition in the Indian telecommunication sector. BSNL is India’s oldest and largest communication service provider. It has footprint throughout India except for the metropolitan cities of Mumbai and New Delhi, which are
managed by Mahanagar Telephone Nigam Limited (MTNL). BSNL is divided into a number of administrative units termed as telecom circles, metro districts, project circles and specialized units. It has 24 telecom circles, 2 metro districts, 6 project circles, 4 maintenance regions, 5 telecom factories, 3 training institutions and 4 specialized telecom units.

### History

During the socialist period of the Indian economy, BSNL was the only telecom service provider in the country. MTNL was present only in Mumbai and New Delhi. During this period BSNL operated as a typical state-run organization, inefficient, slow, bureaucratic, and heavily unionized. As a result, subscribers had to wait for as long as five years to get a telephone connection. The corporation tasted competition for the first time after the liberalization of the Indian economy in 1991. Faced with stiff competition from the private telecom service providers, BSNL has subsequently tried to increase its efficiencies itself. BSNL was born in 2000 after the corporation DOT. The corporation of BSNL was undertaken by an external international consulting team consisting of a consortium of A.F.Ferguson&co, JB Dadachanji and NM Rothschild and was probably the most complex corporation exercise of its kind ever attempted anywhere because of the quantum of assets and over half a million directly and indirectly employed staff. Satish Mehta, who led the team later confessed that one big mistake made by the consortium was to recommend the continuation of the state and circle based geographical units which may have killed the synergies across regions and may have actually made the organization less efficient than it had been a seamless national organization. Vinod Vaish, then chairman of the telecom commission made a very bold decision to promote younger talent from within the organization to take up a leadership role and promoted the older leaders to a role in licensing rather than in managing the operations of BSNL.

BSNL has been providing connections in both urban and rural areas. BSNL has also unveiled cost effective broadband internet access plans (Data one) targeted at homes and small business. At present, BSNL enjoys around 60% of market share of ISP services. 2007 was declared as year of broadband in India and BSNL announced plans for providing 5million broadband connectivity by the end of 2007. BSNL upgraded data- one connections for a speed of up to 2Mbps without any extra cost.
This 2Mbps broadband service was provided by BSNL at a cost of just US$11.7 per month (as of 21 July 2008) and at 8.5GB monthly limit with 0200-0800 hrs as no change period. Further, BSNL is rolling out new broadband services such as triple play. BSNL planned to increase its customer base to 108 million by 2010. With the frantic activity in the communication sector in India, the target appears achievable. BSNL is a pioneer of rural telephony in India. BSNL has recently secured 80% of the US $580m (INR 25billion) rural telephony project of the Government of India.

On 20th March 2009, BSNL advertised the launch of blackcherry services across its telecom circle in India. The corporation has also launched 3G services in selected cities across the country. As of December 2011, many other private operators have started rolling out their 3rd Generation (aka3G) services alongside and are enjoying some success in their campaigns to get market share. While BSNL still maintains its connectivity standards it has expanded to many more areas including rural areas with their 3G services. Also, the network infrastructure has been upgraded from to provide 3.6 Mbits/sec to 7.2 Mbits/sec. MNP (mobile number portability) is a service that lets customers change wireless service provider while retaining their actual mobile number. BSNL has seen many customers opting for this service to move away from the services to other operations. Despite this, as the Indian wireless market grows, BSNL still has a loyal base of subscribers and more subscribers are being added to it. BSNL announced the discontinuation of its telegram services from 15th July 2013. It was opened to the public in February 1855 and was upgraded to a web-based messaging system in 2010, through 182 telegraph offices across India.

- **Broad Band:**

  It is available in India since 14th January 2005 and until 30th September 2007 it was known as Data one. BSNL is commissioning a multi-gigabit, multi-protocol, IP infrastructure through national internet backbone and broadband access network. The broadband service will be available on digital subscriber line technology, spanning across 198 cities. NIB-II would have put India at par with more advanced nations. The services that it would support include always –on broadband access to the internet for residential and business customers, content – base services, video- multicasting, video- on – demand and interactive gaming, audio and video conferencing, IP telephony, distance learning, messaging, multi – site MPLS VPNs with quality of
service guarantees. The subscribers would have been able to access the above services through subscriber service selection system (SSSS) portal. The service will be given through multiprotocol label switching (MPLS) based IP infrastructure. Layer I of the network will consist of a high-speed backbone composed of 24 crore routers connected with high – speed 2.0 Gbit/s (STM-16) links.

**BSNL Mobile:**

It is a mobile phone service provider of the Indian public enterprise. It was formerly known as Cell-one. It provides both pre-paid and post paid mobile services and many value added services. BSNL mobile has a pan- India presence with presence in all the 21 telecommunication cellular circles in India. BSNL mobile provides all of India with roaming access, including Delhi and Mumbai, and international roaming access to more than 300 networks across the world. Many private telecom operators have entered the Indian market and acquired many customers and have given stiff competition to Cell-one in recent years. The major private players are Idea, Airtel, Reliance communications, Tata Docomo, Aircel and many more. Cell-one started their GPRS and EDGE service in 2005 and has coverage in major cities and towns and more places are being covered. BSNL mobile offers both GSM and CDMA prepaid and post paid services.

BSNL provides almost every telecom service in India and following are the services offered

- **Optical infrastructure and DWDM:** BSNL owns the biggest OFC network in India. DWDM network is one of the biggest in BSNL are mainly of united telecom limited (UTL) and declared lowest cost in competitive bidding. Rest DWDM equipments are from Huawei. The SDH equipments are mainly from Huawei, ZTE, ECI, VT star etc.

- **Market share:** BSNL has more than 60% of market share in India and stands as 5th Telecom operator in India.

- **Managed networks services:** BSNL is providing complete Telecom Service solutions to the enterprise customers i.e., MPLS connectivity, point to point leased lines and internet leased lines.
- **WLL-CDMA telephone services**: BSNL’s WLL (wireless in local loop) service is a service giving both fixed line telephony and mobile telephony.

- **Intelligent Network (IN)**: BSNL offers value-added services, such as free phone service (FPH), India telephone card (prepaid card) account card calling (ACC), Virtual Private Network (VPN), Tele-voting, Premium Rae Service (PRM), Universal Access Number (UAN)

- **3G**: BSNL offers 3G or the 3rd generation services which includes facilities like video calling, mobile broad band, live TV, 3G video portal, streaming services like online full length movies and video on demand etc.

- **IPTV**: BSNL also offers the internet protocol television facility which enables customers to watch television through internet.

- **FTTH**: Fiber to the home facility that offers a higher band width for data transfer. This idea was proposed on post-December 2009.

- **Helpdesk**: BSNL’s Helpdesk (helpdesk) provides support to their customers for their services.

- **VVOIP**: BSNL, along with Sai info system-an information and communication technologies (ICTs) provider- has launched voice and video over internet protocol. This will allow making audio as well as video calls to any landline, mobile, or IP phone anywhere in the world, provided that the requisite video phone equipment is available at both ends.

- **Wi-Max**: BSNL has introduced India’s first 4th generation high speed wireless broadband access technology with the minimum speed of 256kbt/s. The focus of this service is mainly on the rural areas where the wired broad band facility is not available.

- **Administrative units**: BSNL is divided into a number of administrative units termed as telecom circles, metro districts, project circles and specialized units. It has 24 telecom circles, 2 metro districts, 6 project circles, 4 maintenance region, 5 telecom factories, 3 training institutions and 4 specialized telecom units.
Bharti Airtel

Bharti Airtel Limited is a leading global telecommunication company with operations in 20 countries across Asia and Africa headquartered in New Delhi, India. It was founded on 7th July 1995 by Sunil Bharti Mittal. The company ranks amongst the top 4 mobile service providers globally in terms of subscribers. In India, the company’s product offerings include GSM, 3G and 4G LTE mobile wireless services, mobile commerce, fixed line services, high speed DSL broad band, IPTV, DTH, enterprise services including national and international long distance services to carries. In the rest of the geographic area it offers 2G, 3G wireless services and mobile commerce. Bharti Airtel had nearly 372 million customers across its operations at the end of June 2017. Bharti Airtel limited, a part of Bharti enterprises is India’s leading provider of telecommunication services. The business at Bharti Airtel has been structured into three individual strategic business units (SBU’s) – mobile services, tele media services and enterprise services. The mobile services group provides GSM mobile services India in 23 telecom circles, while the B&T business group provides broadband and telephone service in 94 cities. The enterprise service group has two sub-units – carriers (long distance service) and services to corporate firms. All these services are provided under the Airtel brand.

Organization structure:

As an outcome of a restructuring exercise conducted within the company, a new integrated organizational structure has emerged with realized roles, responsibilities and reporting relationships of Bharti’s key team players with effect from March 1, 2006. This unified management structure of ‘one Airtel’ enables continued improvement in the delivery of the group’s strategic vision.

Bharti Airtel, formerly known as Bharti- tele ventures limited (BTVL) is India’s largest telecom business operator with more than 75 million subscribers. It also offers fixed line services and broad band services. It offers its telecom services under the Airtel brand and is headed by Sunil Mittal. It provides telephone services along with national and international long distance services. It also has a submarine cable connecting Chennai & Singapore. It provides end-to-end data and enterprise services to the corporate customers through its nationwide fiber optic backbone, last
mile connectivity in fixed – line and mobile circles, VSATs, ISP and international band width access through the gateways and landing stations. Airtel is the largest cellular service provider in India in terms of number of subscribers. Bharti Airtel owns the Airtel brand and provides the following services under the brand name Airtel. Mobile services are using GSM technology/ broadband & telephone services (telecommunications consulting for corporate). It is present in all the 23 circles of the country. In April 2006, Bharti Global

Limited was awarded a telecommunications licence in Jersey in the channel island by the local telecommunication regulate, the JCRA. In September 2006, the office of utility regulation in Guernsey awarded Guernsey Airtel with a mobile telecommunication licence. In May 2007, Jersey Airtel and Guernsey Airtel announced the launch of a relationship with Vodafone for island mobile subscribers. In July 2007, Bharti Airtel signed an MOU with Nokia – Siemens for a 900 million dollar expansion of i4 mobile and fixed network. In March 2008, Bharti Airtel rolled out third generation service in Sri-Lanka in association with Singtel. This is because Singapore – based Asian telecom major, Singtel, which owns a little over 30% in Bharti Airtel, is a major player in the 3G space as the third generation network in several markets across Asia.

■ Suppliers / Partners:

The company's mobile network equipment partners include Ericsson and Nokia. In the case of the broad band and telephone services and enterprise equipment suppliers include Siemens, Nortel, and Corning among others. The company has an information technology alliance with IBM Daksh, Hinduja TMT, Tele tech and Mphthsis. The company has a strategic alliance with Sing Tel. The investment made by Singtel is one of the largest investments made in the world outside Singapore by the company. The company’s mobile network equipment partners include Ericission and Nokia. In the case of the broad band and telephone services and enterprise services, equipment suppliers include (i) Siemens (ii) Nortel (iii) Corning.
VODAFONE

Vodafone is India’s second largest mobile network operator with market share of 18.42%. It is headquartered in Mumbai, Maharashtra. It has approximately 206.44 million customers as of Jan 2017. It offers both pre-paid and postpaid GSM cellular phone services. It has launched its 4G service in December 2015.

Vodafone was founded in the year 1983 as Racal telecom head quartered in the year 1991 at Newbury England, UK. The name Vodafone comes from voice datafone, chosen by the company to reflect the provision of voice and data services over mobile phones. In the year 1983, Racal Electronics Plc’s subsidiary Racal Stratefic Radio Ltd won one of the two UK cellular telephone network licenses. The network, known as Racal Vodafone was 80% owned by Racal with Million and the Hambros technology trust owning 15% to 5% respectively. Vodafone was launched on 1 January 1985. Racal Strategic Radio was renamed Racal Telecommunications Group Limited in 1985. On 29th December 1986, Racal Electronics bought out the minority shareholders of Vodafone for GLB 110 million. In September 1998, the company was again renamed Racal Telecom and on 26 October 1988 Racal Electronics floated 20% of the company. The floatation valued Racal telecom at 1.7% billion. On 16th September 1991 Racal telecom was demerged from Racal Electronics as Vodafone group.

In July 1996, Vodafone acquired the 2/3 of talk land. On 19th November 1996, in a defensive move, Vodafone purchased people phone for 77million, a 181 store chain whose customers were overwhelmingly using Vodafone’s network. In a similar move the company acquired the 80% of Astec Communications. But, it did not win, the O’s in the Vodafone logo.

On 29th June 1999, Vodafone completed its purchase of Touch communication Inc and changed its name to Vodafone air touch Plc. Trading of the new company commenced on 30 June 1999. To approve the merger, Vodafone sold it 17.2% stake in E-plus mobile funk. The acquisition gave Vodafone a 35% share of Mannesmann, owner of the largest German Mobile network. On 21 September 1999, Vodafone agreed to merge its US wireless assets with those of Bell Atlantic Corp from Verizon wireless. The merger was completed on 4 April 2000. In November 1999, Vodafone
made an unsolicited bid for Mannesmann that had been increased by the latter’s purchase of Orange, the UK mobile operator; Chirs Gent would later say Mannesmann’s move into the UK broke a “gentleman’s not to compete in each other’s home territory”. The hostile takeover provoked strong protest in Germany and a ‘titanic struggle’ which saw Mannesmann resist Vodafone’s efforts. However, on 3 February 2000, the Mannesmann Board agreed to an increased offer of 112bn, then the largest corporate merger ever. The EU approved the merger in April 2000. The conglomerate was subsequently broken up and all manufacturing related operations were sold off.

About Hutchison Essar:

In the year 1992, Hutchison whampoa and its Indian business partner established a company that in 1994 was awarded a licence to provide mobile telecommunication services in Mumbai (Bombay) and launched commercial service as Hutchison Max in November 1995. Hutchison telecom’s initial public offering in 2004, Hutchison whampoa had acquired interests in six mobile telecommunication operators providing service in 13 of India’s 23 licence areas following the acquisition of BPL that number increased to 16. In 2006, it announced the acquisition of a company that held licence applications for the seven remaining licence areas. The company grew its business in the largest wireless market in India in cities like Mumbai, Delhi and Kolkata. In the densely populated urban areas it was able to establish a robust network, well known brand and large distribution network – all vital to long – term success in India. It also targeted business users and high end post-paid customers which helped Hutchison Essar to consistently generate higher average revenue per user (ARPU) than its competitors. By adopting this focused growth plan, it was able to establish a leading position in India’s largest market providing the resources to expand its footprint nationwide.

In February 2007, Hutchison telecom announced that it has entered into a binding agreement with a subsidiary of Vodafone group plc to sell its 67% direct and indirect equity and loan interest in Hutchison Essar limited for a total cash consideration (before costs, expenses and interests)of approximately US $ 11.1 billion or UK 87 billion.
Some important years of Hutchison Essar

1992: Hutchison whampoa and man group established Hutchison man

2000: Acquisition of Delhi operation entered Calcutta and Gujarat Markets through ESSAR acquisition.

2001: Won auction for licenses to operate GSM services in Karnataka, Andhra Pradesh and Chennai

2003: Acquired Aircel Digilink (ADIL – Essar subsidiary) which operated in Rajasthan, UP, Haryana telecom circles and renamed it under Hutch brand.

2004: Launched in three additional telecom circles of India namely ‘Punjab’, ‘UP’ and “WB”

2005: Acquired BPL, another mobile service provider in India.

2008: Vodafone acquired Distinct Wireless, a service provider in Orissa and has successfully launched its services in the following circle.

2008: Vodafone launched the Apple iphone 3G to be used on its 17 circles’ 2G network.

2011: Vodafone Group buys out its partner Essar from its Indian mobile phone business. It paid $5.46 billion to take Essar out of its 33% stake in the Indian subsidiary. It left Vodafone owning 74% of the Indian business

2014: On 11 April, Vodafone acquires 100 percent stake in Vodafone India

2014: On 6 August Vodafone India launches Vodafone RED 4, a new postpaid plan across India.

2015: On 17 January, Vodafone launches its iPhone plans across India

2015: Vodafone announced 4G network service in India.

➢ Idea cellular services

Idea cellular, a part of Aditya Birla group, is one of India’s leading GSM mobile service operators. This telecom company has licenses to operate in all 22 service areas. Presently, it is operating in 13 circles. Idea cellular value added services include GPRS, call conference, GSM, GPS and also. Idea cellular, commonly referred to as Idea, is an Indian mobile network operator based in Mumbai, India. India is a
pan – India integrated GSM operator offering 2G 3G and 4G services. Revenue market share is 18.5% and it has a subscriber base of over 192.06 million as of Jan 2017. Idea is India’s third largest mobile operator.

Tata’s foray into the cellular market with its own subsidiary, Tata Indicom, a CDMA based mobile provider, cropped differences between the Tatas and the Birlas. This dual holding by the Tatas also became a major reason for the delay in Idea being granted license to operate in Mumbai. This was because as per Department of Telecommunications (DOT) license norms, promoter could not have more than 10% stake in two companies operating in the same circle. Tata Indicom was already operating in Mumbai when Idea filed for its License.

The Birla thus approached the DOT and sought its intervention and the Tatas replied by saying that they would exit Idea but only for a good price. On 10 April 2006, the Aditya Birla group announced its acquisition of the 48.18% stake held by the Tatas at Rs.40.51% a share amounting to Rs.44.6 billion. While 15% of the 48.14% stake was acquired by Aditya Birla Nuvo, a company in charge of the Birla’s new business initiatives, the remaining stake was acquired by Birla family owned company. Currently, Adithya Birla Group holds 49.05% of the total shares of the company; Malaysia based Axiala control a 19.96% stake in the company.

On 19th May 2010, the 3G spectrum auction in India ended. Idea paid Rs. 5768.59 crore for spectrum in 11 cities. The circles provide 3G in Andhra Pradesh, Gujarat, Haryana, Himachal Pradesh, Jammu & Kashmir, Kerala, Tamil Nadu, Madhya Pradesh, Maharashtra, Goa, Punjab, Uttar Pradesh (East) and Uttar Pradesh (West)

On 28 March 2011, Idea launched 3G services in Gujarat, Himachal Pradesh and Madhya Pradesh and in the cities like Ahmadabad, Shimla and Indore. This makes Idea the sixth private operator and eight overall to launch its 3G services in the country following Tata Docomo, Reliance Communication, Airtel, Aircel and Vodafone.
Idea Cellular currently supports up to 21% Mbit/s over 2G speeds of 256kbit/s. However, different handsets support different speeds, from 384kbits/s, 3.6 Mbits, 7.2 Mbits to 21.1Mbits. Speeds also depend on the 3G plan/recharge that users opt for. Idea cellular has announced a cut of 70% in the tariff of its 3G services.

On 23 November 2011, Idea cellular launched two affordable 3G handsets in India: idea 3G smart phone priced at Rs. 7992 and idea 3G smart phone priced Rs.5850, both handsets are based on Android 2.2 froyo.

Idea has also launched a dual SIM android smart phone in India on 15 June 2012 named as idea ID – 918 at a price of Rs. 5994 ($108 appros). It features Android 12.305, 3.2 – inch capacitive touch screen, 3G, Wi-Fi and 3.2 MP rear facing camera.

On 5th March 2013, Idea launched another 3G smart phone called Idea Zeal 3G which is a Dual SIM phone with 3 Megapixel camera.

**Customer service**

The company has its retail outlets under the ‘MY IDEA’ banner. The company has also been the first to offer flexible tariff plans for prepaid customers. It also offers GPRS services in urban areas.

**Competition**

Idea competes with 11 other mobile operators throughout India. They are Airtel, Aircel, BSNL, MTNL, MTS, Reliance Communications, Tata-Docomo Videocon, Virgin Mobile, Vodafone.

Idea’s robust pan-India coverage built on a network of over 100000 2G and 3G cell site spreads over 55,000 towns in India.

Using the latest technology, Idea provides world-class service delivery through the most extensive network of customer touch points. Idea has nearly 4500 exclusive outlets and over 7000 call center seats. Idea’s customer service delivery platform, ISISO 9001:2008 is certified making it the only operator in the country to have this standard certificate for all 22 service areas and the corporate office.
Idea has consistently stayed ahead of the industry in VRL reports Idea’s thought on Mobile Number Portability (MNP) has enabled it to stay as the top gainer with the highest net gain. Every 4\textsuperscript{th} mobile user who exercises choice through MNP prefers Idea.

Idea offers a range of high-speed mobile broad band devices including Android based 3G smart phones, dongles etc. Idea’s wide portfolio of 3G smart phones offer the latest in 3G applications and high-end data services such as idea TV Games, social networking etc. at affordable prices.

Idea has been a pioneer in introducing customized product offerings for segmented customers. It is the first mobile operator to introduce innovative value added services in the Indian telephony market, and has remained ahead of the industry in data product offerings. Idea was listed on the National Stock Exchange (NSE) and Bombay Stock Exchange (BSE) in India.

Idea has received several national and international recognitions for its path-breaking innovations in mobile telephony products and services. Idea won the prestigious NDTV business leadership Award in the telecom category for its solid, consistent performance in 2012. It was the winner of ET telecom awards 2012 in the categories – ‘customer experience enhancement’, ‘excellence in marketing’ and ‘innovative products’. Idea also won the ‘best ad campaign of the year’ award for the popular honey bunny campaign at the Tele Net telecom Award 2012.

Idea won the ‘best brand campaign’ at the esteemed world communication Awards in 2012 and 2011. It also won the GSM association Award for ‘Best Billing and Customer Care Solution’ for two consecutive years and was awarded ‘Mobile Operator of The Year – India’ for 2001 and 2000 at the annual Asian Mobile News.