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The Changing Pattern of Telecom Sector in India

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ABSTRACT

The telecom sector is a vibrant and important sector which has been recognized world over as an important tool for socio economic development of a nation. Presently, telecommunications has evolved as a basic infrastructure like electricity & power, transportation, roads etc. With the advent of next-generation technologies 3G and 4G Broadband Wireless Access Services rolled out by operators, the demand for telecom equipment has increased. The Industry has grown over twenty times in just ten years, from under 37 million subscribers in the year 2001 to over 846 million subscribers in the year 2011. India now has the second largest telecommunication network in the world, next only to China. India crossed the landmark of one billion telephone subscribers in the year 2015-16. The total number of telephone users (both fixed and mobile phone) in India now is 1206.71 million subscribers as of September 2017.The government is offering various sops to industry to boost domestic manufacturing in the field of electronics. According to a report by leading research firm Market Research Store, the Indian telecommunication services market will likely grow by 10.3 per cent year-on-year to reach US$ 103.9 billion by 2020.

Keywords: Wireline, Wireless, Internet, Tele-density, Portability.

INTRODUCTION:

The telecom sector is a vibrant and important sector which has been recognized world over as an important tool for socio economic development of a nation. Telecom services have been an instrument of empowerment, connecting people across the globe and increasing access. The role of dynamic, responsive, business oriented telecom sector in promoting growth is well recognized and extensively documented. Over time, telecommunications has evolved as a basic infrastructure like electricity & power, transportation, roads etc. The telecom sector is highly dynamic both in terms of new technologies and break through innovations. Telecommunication sector is recognized as capital intensive sector not just because of investment required for creation, expansion and maintenance of the telecom network but for acquisition of air waves.

The Indian telecom sector has made rapid strides during the last few years because of several reform and initiatives undertaken by the Department of Telecommunications. The Industry has grown over twenty times in just ten years, from under 37 million subscribers in the year 2001 to over 846 million subscribers in the year 2011. India now has the second largest telecommunication network in the world, next only to China. India crossed the landmark of one billion telephone subscribers in the year 2015-16. The total number of telephone users (both fixed and mobile phone) in India now is 1206.71 million subscribers as of September 2017. It has one of the lowest call tariffs in the world enabled by mega telecom operators and hyper-competition among them. India has the world's second-largest Internet user-base with 431.21 million internet subscribers in the country as of June 2017. Indian telecom industry underwent a high pace of market liberalisation and growth since the 1990s and now has become the world's most competitive and one of the fastest growing telecom markets.

The mobile industry in India, currently contributes 6.5 per cent (USD 140 billion) to Country's GDP, and employing over 4 million people (direct and indirect).It is projected to grow rapidly in the coming years. Telecommunication has supported the socioeconomic development of India and has played a significant role to narrow down the rural-urban digital divide to some extent. The rapid strides in the telecom sector have been facilitated by liberal policies of the Government that provides easy market access for telecom equipment and a fair regulatory framework for offering telecom services to the Indian consumers at affordable prices. The exponential growth witnessed by the telecom sector in the past decade has led to the development of the telecom equipment manufacturing and other supporting industries. With the advent of next-generation technologies and 3G and Broadband Wireless Access Services rolled out by operators, the demand for telecom equipment has increased. In an attempt to capitalize on this opportunity, the government and policymakers are focusing on developing the domestic manufacturing industry. The Indian equipment manufacturing sector has come a long way in the past few years. From being an import-centric industry, it is slowly but steadily moving towards becoming a global telecom equipment manufacturing hub.The government is targeting to increase exports of telecom products and services to USD 10 billion (about Rs 62,000 crore) in the next five years. India's telecom exports currently stands around Rs 32,000 crore, of which Rs 20,000 crore is products and equipment and balance Rs 12,000 crore is from services. Government is making efforts to reduce imports of electronic products and to meet requirement of domestic market through indigenous production. The government is offering various sops to industry to boost domestic manufacturing in the field of electronics. According to a report by leading research firm Market Research Store, the Indian telecommunication services market will likely grow by 10.3 per cent year-on-year to reach US$ 103.9 billion by 2020.

REVIEW OF LITERATURE:

Sinha (2002) discussed the growing competition among the cellular service providers in Delhi and Mumbai cities as well as defensive strategies taken by the operators to retain the customers. It was concluded that due to price war among the cellular operators, the ultimate beneficiary was the cellular customer.

Kasesniemi and Rautiainen (2002) state that mobile phone is used to facilitate several functions. It helps users to know the news headlines, TV and movie listings, horoscopes, directory and address, weather forecasts, sports scores and dictionaries. In addition, users can make inquiries for banking and flight or train schedule. Message collecting, circulating chain messages and collective writing and reading the messages are increasingly being performed by them. Many young people copy their messages into calendars, diaries or special notebooks designed by handset manufacturers.

Melody (2003) mentions that the success of telecommunication industry depends on the efforts and investments. In a competitive market, the service providers are expected to compete on both price and quality of services and also it is necessary for the service providers to meet the consumers' requirements and expectations in price and service quality. The author also states that today, the development of communication technology ignores the global border and makes world "global village". This reform of the communication technology has since been expanded to include the transformation of the traditional voice telecom network into an expanded and enhanced information infrastructure, which is capable of communicating all forms of information content.

Kathuria (2004) reviewed the Indian telecom industry's market structure from 1991 with special focus on the Asia-Pacific region. It was discussed that the Indian telecom sector had grown rapidly over the last ten years but still lagged behind China and other Asian countries in the context of investment and tariff rates. The author had further discussed the impact of WTO negotiations on the Indian telecom industry and suggested the scope of future growth in this sector without changing the existing regime.

Mazzoni (2007) research work comments that today mobile phone is not just a substitute of landline telephone, but more than that. Users can use it not only for calling and messaging but for sending pictures, updating sports and news, playing games, listening to music, watching movies, photography, transferring data and pictures, doing calculation, reminding the important days and organizing their day-to-day activities.

Archana (2008) in her research article states that until the mid-nineties it was relatively difficult to acquire telephone and costly to use. Further, the author discusses on the Indian telecom success story, which is a combined result of sound policy, excellent regulation and an innovative and enterprising private sector. It has resulted in potential to transform the nation of the lives of Millions poor Indians, especially the 70 per cent rural population. Today less than thirty per cent of the country's 261 Million mobile subscribers reside in villages.

N.Swapna (2012) in her Research Article "Telecommunication Sector in India – An Analysis" concluded that the telecom industry in India has witnessed a phenomenal and manifold growth over the recent years. In the country, personalized telecom access has become an essential necessity of life for a growing number of people.

The telecom sector in India holds unlimited potential talking of future growth. In the nation, both Public as well as private firms are vigorously enhancing their technologies in a venture to take the telecom industry in the country to a much higher development.

Dr.Papori Baruah & Rashmi Baruah (2014) concluded in their Research Article "Telecom Sector in India: Past, Present and Future" that the growth and development of Telecom sector of India has made it a key contributor in India's economic and social up gradation. Every functional division and service provider of Telecom Sector of the country is trying to provide world class telecom infrastructure in its area of operation to give services to its customers and so, helping the country to progress in the global scenario.

Ms.Pritish, Dr.Taruna Saxena (2015) in their Research Article on "An Analysis of the Indian Telecom Industry" concluded that the Indian Telecom Industry contributes significantly to the overall socioeconomic development of India. It is an essential tool for the growth of the nation and the various telecom service providers offer voice and data services to the customers across different regions of the country including both urban and rural areas thereby facilitating the growth of this industry.

Telecom Regulatory Authority of India (1997-2017) in its report stated the genesis of Telecom Sector that the subscriber base in March, 1997 was 14.88 Million and it rose to 1.15 billion by December, 2016.This has been an extraordinary journey for the Indian telecom sector and its users.

OBJECTIVES OF THE STUDY:

The study has the following objectives in order to examine the changing pattern of Indian telecom sector:

1. To know the number of wireline and wireless telephone subscribers along with the market share of service providers.
2. To examine the emergence of internet service in India.
3. To study the changing pattern of Tele-density in India.
4. To identify the service area wise mobile number portability status in India.

THE CHANGING PATTERN OF TELEPHONE SUBSCRIBERS:

To discuss the changing pattern of telephones subscribers in India, the telephone subscribers are broadly classified in to the following two types:

1. Wireline Telephone Subscribers. 2. Wireless Telephone Subscribers.

WIRELINE TELEPHONE SUBSCRIBERS:

Before the New Telecom Policy was announced in 1999, only the Government-owned BSNL and MTNL were allowed to provide land-line phone services through copper wire in India with MTNL operating in Delhi and Mumbai and BSNL servicing all other areas of the country. Due to the rapid growth of the cellular phone industry in India, landlines are facing stiff competition from cellular operators, with number of wireline subscribers fell from 37.90 million in December 2008 to 23 million in December 2017. This has forced land-line service providers to become more efficient and improve their quality of service. As of December 2017, India has over 23 million wireline customers. In order to improve the wireline connections ,MTNL regularly promotes landline and broadband services through print, advertising, FM channels, outdoors and digital media and regularly gives attractive tariffs and offers to customers. The BSNL has also introduced customer attractive schemes like 'Sunday Free Calling' and 'Free Night Calling' to popularize its landline connections. All the efforts made by MTNL and BSNL are most appreciable, but the people are not attracting the landline connections. The landline connections are declining year after year very drastically. The following Table – 1 presents the number of Rural and Urban wireline telephone subscribers during the period of ten years from 2007-08 to 2016-17.

Results and discussion:

The urban wireline subscribers are much more than the rural wireline subscribers in the entire period of the study. The percentage of urban wireline subscribers moved from 72.13 per cent in the year 2008-09 to 84.22 per cent in the year 2016-17. It is noticed that there was a clear cut increasing trend in the urban wireline subscribers in the study period. All government offices, different types of financial institutions, various corporate firms and Tele marketers etc., were situated in the urban areas. Therefore there is a continuous demand for wireline phone connections for voice and data purpose. Thus there was a continuous growing demand in case of urban wireline subscribers. Whereas the percentage rural wireline subscribers is registered at

29.53 per cent in the year 2007-08,then after it was gradually decreased from year after year and reached to 15.78 per cent in the year 2016-17. The percentage of rural wireline subscribers is in decreased trend. It is due to the massive usage of mobile phones with lower tariffs offered by various private telecom service providers in the rural areas. The relationship between urban and rural wireline subscribers is inverse. Further it is also noticed that there is a continuous decline in the total wireline subscribers and moved from 39.42 Million subscribers in the year 2007-08 to 24.40 Million subscribers in the year 2016-17. It is because of wide usage of mobile phones irrespective of income group and age group.

Market Share of Wireline Connections of Service Providers:

Different Telecom Service providers are providing services in different parts of the India. No single operator is providing telecom service through the country. The Wireline services are providing by 5 licensed private operator's viz., Bharathi Airtel Ltd, Tata Teleservices Ltd, HFCL Infotel Ltd, Shyam Telelink Ltd, Reliance Communications Ltd, and public sector units BSNL and MTNL as on 31st March 2008 and in addition to the above Vodafone also providing wireline services in India. The largest public sector unit in telecom sector, BSNL is providing services all over India except Delhi and Mumbai, MTNL is providing services in Delhi and Mumbai only, Bharathi Airtel Ltd operating services in Andhra Pradesh (including Telangana), Delhi, Gujarat, Haryana, Himachal Pradesh, Madhya Pradesh (including Chhattisgarh), Maharashtra, Mumbai, Punjab, Tamil Nadu (including Chennai), Karnataka, Kerala, Kolkata, Rajasthan, UP (East) and UP (West. Tata Teleservices Ltd. & Tata Teleservices (Maharashtra) Ltd. providing services All India except North Eastern states Assam and J&K. Quadrant Tele ventures Ltd. (HFCL) is providing only in Punjab, Sistema Shyam Telelink Ltd operating services in Rajasthan only and Reliance Communications Ltd., providing services All India except J&K, Assam & North-Easter states and Vodafone is operating all India except J&K.The following Table – 2 presents the Market share of wireline connections of the public sector units BSNL, MTNL and other Private Operators during the period of ten years from 2007-08 to 2016-17.

Results and discussion:

The BSNL is the largest public service provider in India. Its flagship is always dominating even after entering of various private sector service providers in to the market. The BSNL enjoying more than 50 per cent of market share in the entire period of the study. The market share of BSNL was registered at 80.05 per cent in the year 2007-08, then after it was gradually declined and reached to 56.10 per cent in the year 2016-17. As against this trend the market share of other private operators is increasing year after year and abnormally reached to 29.71 per cent in the year 2016-17 from 10.62 per cent in the year 2007-08. Whereas the share of another public sector organization MTNL, which is providing the services only in Delhi and Mumbai is increased from 9.33 per cent to 14.19 per cent during the period under review. It can be concluded that even after a stiff competition from various private sector operators the BSNL and MTNL continuing their dominating their market share in overall India in general and Delhi and Mumbai in particular.

The Public Call Office:

The Public Call Office (PCO) is a telephone facility located in a public place in India and Pakistan. It is also another name in the United Kingdom for a public telephone box (postal addresses for these kiosks sometimes include "PCO"). In India, manned and automated (coin-operated payphone) versions of the service are in existence. BSNL, a public sector corporation, has the largest installation of Public Call Offices in India. At the end of March, 2017 there were about 4.52 lakh PCOs operating in India. Private sector operators such as Reliance Infocomm, Tata Indicom, Hutch, Idea and Airtel predominantly are prepaid PCO providers and have a moderate number of PCOs in the public landscape. There are two types of PCOs; landline and wireless. The wireless PCOs used CDMA and GSM technologies. Reliance and Tata Indicom are CDMA-based prepaid PCO connection providers. Airtel, Idea and Hutch are GSM-based prepaid PCO connection providers. Initially, the Department of Telecom, and later BSNL, MTNL and Airtel provided fixed landline postpaid PCO connections. BSNL and MTNL also provide prepaid PCOs. The BSNL, which is the largest public sector telecom company of India, its Bhopal Unit has first time started an Internet café on optical fiber. Even those who had landline phones used PCOs to make STD and ISD calls. Technical advancements saw PCOs allowing conferencing facility that helped people make STDs sitting at their home using the PCO lines. The advent of coin box phones saw more public phones at petty shops, grocery shops, tea stalls etc., and even industrialists who have invested crores of rupees in hotels have three to five coin box phones. The public call offices are used to cater to majority population's telephone needs. The decreasing revenue of most standalone PCOs only signals that many of them

will wind up sooner or later. Everyone has got a mobile phone now. Many people are not going to public call offices, their profit who are running PCOs are coming down and in turn they are closing the PCOs. Initially many people were running PCOs for their self-employment but they are forced to wind up due to poor revenue. The service provider wise particulars of PCOs and their market share from the year 2007-08 to 2016-17 is given in the Table – 3.

Results and discussion:

The total number of PCOs in the country declined from 61, 85,904 connections in the year 2007-08 to 4, 52,036 connections in the year 2016-17.The number of PCOs continued shows declining trend, however in the year 2008-09 there is a slight growth rate of 0.30, then after the growth is in negative ranged from 23.02 to 39.83 during the period of the study. Among the total PCOs the BSNL connections are much more than the all other PCOs connections in the entire study period. The percentage of BSNL PCOs connections were ranged between 33.17 per cent and 61.51 per cent. Whereas the MTNL PCOs contributing a meager share around 3 per cent only. Among the private service providers PCOs connections the Reliance enjoyed a major share. However the number of Reliance PCOs connections drastically declined from 20, 45,500 in the year 2007-08 to zero connections in the year 2016-17. In case of Tata PCOs connections, it is observed that there in the second place among the private sector operators. The percentage of Tata PCOs declined from 29.40 per cent in the year 2010-11 to 4.20 per cent in the year 2016-17. Similarly, the number of PCOs of HFCL and Shyam Telelinks declined from 36794 to 2000 and 41700 to 10000 respectively in the period of the study.

Village Public Telephones (VPTs):

The Government of India has put more efforts towards provision of reliable, affordable public access services for the 70 per cent population that resides in rural India. Village Public Telephones have served an effective means of communication in rural India. Given the low income levels of the bulk rural population, public access telephone services have extremely significant role to play till such time that commercial availability and affordability of private telephone facilities is ensured. Bharath Sanchar Nigam Limited is the largest provider of VPTs over the length and breadth of the country. There are 2, 29,685 VPTs in India at the end of March, 2017. The data related to operator wise VPTs and their market share is presented in the Table – 4.

Results and discussion:

The total number of Village Public Telephones are abnormally declined from 5, 59,503 in the year 2007-08 to 2, 29,685 in the year 2016-17.However from the year 2009-10 there was 2.79 per cent growth in the total VPTs. Then after in the year 2010-11 the growth rate declined to 1.48 per cent and in 2011-12, it was - 0.17 per cent. Again in the year 2012-13, there was a growth of 1.01 per cent. From 2013-14 and 2014-15 the growth rates are -0.1 and -0.5 respectively. In the year 2015-16 the growth rate was 0.14 per cent. But in the year 2016-17 it was radically declined to –60.86 per cent. It is pertinent to mention here that total 3, 57,117 Village Public Telephones have been disconnected as those were non-techno commercially viable, besides subsidy support against them also expired.

Among the total Village Public Telephones BSNL connections were moved from 92.87 per cent to 99.44 per cent during the period of the study. It shows that the BSNL has been enjoying the monopolistic benefits by attracting the more number of customers with different types of subsidized plans. Among the private sector telephone operators only the Tata connections are visible in the rural areas. Only in the year the Tata connections are significant at 32463 in the year 2007-08 then after year to year they are disconnected and reached to 1282 in the year 2016-17. In case of HFCL , Shyam Telelinks and Others Village Telephone Connections are insignificant and they are not having any connections Village Public Telephone connections in the year 2016-17.

WIRELESS SUBSCRIBERS:

In August 1995, the then Chief Minister of West Bengal, Jyoti Basu made the first mobile phone call in India to the then Union Telecom Minister Sukhram. Sixteen years later 4G services were launched in Kolkata in 2012.With a subscriber base of more than 1,151.94 Million as of January 2018, the mobile telecommunications system in India is the second largest in the world and it was thrown open to private players in the 1990s. GSM was comfortably maintaining its position as the dominant mobile technology with 80 per cent of the mobile subscriber market, but CDMA seemed to have stabilized its market share at 20 per cent for the time being.

The country is divided into multiple zones, called circles (roughly along state boundaries). Government and

several private players run local and long distance telephone services. Competition, especially after entry of Reliance Jio has caused prices to drop across India, which are already one of the cheapest in the world. The rates are supposed to go down further with new measures to be taken by the Information Ministry. In September 2004, the number of mobile phone connections crossed the number of fixed-line connections and presently dwarfs the wireline segment substantially.

The mobile subscriber base has grown from 5 Million subscribers in 2001 to over 1,151.94 Million subscribers as of January 2018. India primarily follows the GSM mobile system, in the 900 MHz band. Recent operators also operate in the 1800 MHz band. The dominant players are Airtel, Jio, Vodafone, Idea Cellular and BSNL/MTNL. There are many smaller players, with operations in only a few states. International roaming agreements exist between most operators and many foreign carriers. The government allowed Mobile number portability (MNP) which enables mobile telephone users to retain their mobile telephone numbers when changing from one mobile network operator to another. The Table - 5 presents the data of number of wireless subscribers in urban and rural.

Results and Discussion:

There was a revolutionary change in the Indian Telecom Sector after 1990s. The people are converting wireline telephone connections to wireless telephone connections. Thus the wireless telephone subscribers are abnormally grown. The wireless telephone subscribers were moved from 261.07 Million in the year 2007-08 to 1170.18 Million in the year 2016-17. There was a highest growth rate of wireless telephone subscribers at 50.06 per cent in the year 2008-09 when compared with the 2007-08. Then after the growth rates were slightly declined at 49.16 per cent, 38.39 per cent and 13.26 per cent in the years 2009-10, 2010-11 and 2011-12 respectively. Only in the year 2012-13 there was a negative growth rate at -5.59 per cent. Then after from 2013-14 onwards the growth rates were recorded at 4.23 per cent, 7.23 per cent, 6.57 per cent and 13.21 per cent in the years 2013-14, 2014-15, 2015-16 and 2016-17 respectively.

Among the total wireless telephone subscribers, urban subscribers are much more than the rural subscribers. In the year 2007-08 the urban wireless subscribers are 75.16 per cent then after year to year gradually declined and reached at 57.46 per cent in the year 2016-17.Whereas rural wireless subscribers were gradually increased year to year from 24.84 per cent in the year 2007-08 to 42.54 per cent in the year 2016-17. Therefore it can be concluded that there is declined trend in urban wireless subscribers, contrary to this there is an increased trend in case of rural wireless subscribers.

GSM vs. CDMA:

The telecom industry has become very competitive, there is a competition between two standards or technologies, namely Global System for Mobile Communications (GSM) and Code Division Multiple Access (CDMA). The history of the mobile services industry can be traced to 1997 when GSM cellular services were started. The GSM network operates in the 900 MHz and 1800 MHz frequency bands. In the GSM technology, the frequency channel is divided into time slots through which the data packets travel without any interference from other calls. The mobile operators can be changed in GSM technology. The GSM enjoys a larger share of the telecom market in India. CDMA was introduced in the end of 2002. Till 2002, Indian mobile operators deployed GSM only. In 2002, the government permitted basic operators to offer limited mobility using the CDMA technology. CDMA is a form of multiplexing which allows numerous signals to occupy a single transmission channel. This technology is used for transmitting data or voice over radio frequencies 800 MHz and 1.9 GHz frequency bands. GSM started with plain voice calls, but now it has a powerful platform capable of supporting mobile broadband and multimedia services. CDMA technology operates in a relatively small amount of spectrum. CDMA was basically designed for providing internet services in mobiles. It is an efficient and reliable IP-based platform on which wireless data applications are delivered. CDMA supports thousands of applications across multiple execution environments (e.g. Java, Linux, Palm, RIM, Windows Mobile, etc.) and customers can choose from a wide variety of handsets, fixed wireless phones, smart phones, notebooks, desktop modems and PC cards to access these applications. One of the most important institutional requirements for competition to emerge and sustain is the introduction of mobile number portability in 2011 that allows a customer to move from one mobile service to another within GSM, and also between GSM and CDMA, while retaining the same number. The particulars of GSM and CDMA subscriber base shown in the Table – 6.

Results and Discussion:

The GSM and CDMA are emerged as the new trend setters in the technology of telecommunication system. The

Table - 6 reveals that the GSM based mobile phone connections were moved from 192.70 Million in the year 2007-08 to 1157.59 Million in the year 2016-17 with growth rate of 600.72. It shows that how the new technology attracted by the subscribers. The GSM based mobile phone connections has been increasing from the year 2007-08 to 2016-17 continuously except in the year 2012-13. It was due to the Supreme Court ordered the cancellation of all the 122 unified access service licenses issued in January 2008. Among the total wireless subscribers base GSM is much dominating position when compared with the CDMA in the entire period of the study. It's only due to the people are attracted with the GSM based Mobile phones with the various features.
The CDMA based mobile phone connections were 68.37 Million in the year 2007-08 and there was an increasing trend in CDMA connections from 2007-08 to 2010-11and then after the CDMA mobile phone connections were declined from the year 2011-12 to 2016-17 continuously. The total GSM and CDMA based mobile connections were 261.07 million in the year 2007-08 and moved to 1170.18 million in the year 2016-17 with the growth rate 448.22. Out of the total wireless subscribers base the percentage of CDMA based mobile phones registered at 26.19 per cent in the year 2007-08 and year after year it has been continuously declined and reached to 1.08 per cent. Therefore it can said that within no time there will be no CDMA subscribers and all wireless subscribers will be converted as GSM subscribers.

Market Share of GSM Service Providers:
There are 11 operators providing GSM mobile services in twenty two circles in India at the end of March, 2017.The total GSM subscribers' base has reached to 1157.59 Million at the end of March 2017. Bharti Airtel with 273.65 Million subscriber base remains the largest GSM mobile operator followed by Vodafone with 209.06 Million, Idea with 195.37 Million, Reliance Jio with 108.68 Million, BSNL with100.21 Million, Aircel with 90.90 Million, Reliance Comm. Group with 83.50 Million, Telenor with 50.49 Million, Tata with 42.09 Million and MTNL with 3.63 Million respectively. Quadrant has closed its GSM mobile service during 2016-17.The market share of different GSM operators is presented in the Table -7.

Results and Discussion:
The data related to market share of GSM service providers indicates that the Bharathi Airtel is the flagship service provider followed by Vodafone and Idea in the entire period of the study. BSNL is in the third position with the percentage of its contribution 18.80 and 15.71 only in the years 2007-08 and 2008-09 respectively. Then after from 2009-10 onwards Idea placed in to third position and BSNL pushed back to fourth place. In the year 2007-08 Bharathi Airtel extended its GSM services to the subscribers of 32.16 per cent, Vodafone with 22.90 per cent, BSNL with 18.80 per cent and Idea with 12.46 per cent. Almost the same position continued up to 2009-10. In case of Reliance its market share was increased from 3.64 per cent in the year 2007-08 to 11.91 per cent in the year 2011-12. Then after its market share was declined year after year and reached to 7.21 per cent in the year 2016-17. Whereas Aircel/Dishnet market share was moved from 5.51 per cent to 8.87 per cent during the period of the study. In case Tata, they entered in to the GSM service market in the year 2009-10 and its market share was 5.62 per cent. It was increased at 6.69 per cent in the year 2010-11 and declined to 6.48 per cent in the year 2011-12, then after there was a continuous declined trend and reached to 3.64 per cent in the year 2016-17. MTNL market share of GSM service is very negligible. The other GSM service providers' market share was moved from 2.85 per cent in the year 2007-08 to 4.36 per cent in the year 2016-17. Reliance Jio created a revolutionary change in the GSM services by entering in to the market on 5th September, 2016. From 5th September,2016 to 31st March,2017 Reliance Jio attracted 9.39 per cent market share by offering a unique combination of telecom , high speed 4G internet data, digital commerce, media and payment services.

Market Share of CDMA Service Providers:
There are only three telecom service providers providing CDMA services in India at the end of March, 2017. The CDMA total subscriber base is 12.59 million at the end of March, 2017. The Tata Teleservices is the leading operator in CDMA service with 6.90 Million customer base followed by Sistema with 4.91 million and BSNL with 0.78 million. The market share of each CDMA service providers year wise data from 2007-08 to 2016-17 is presented in the Table – 8.

Results and Discussion:
It is observed that the Reliance occupied more than 50 per cent of the market share from the year 2007-08 to 2015-16. In the year 2010-11 its market share was declined to 48.27 per cent because a drastic fall from its peak of 114 Million subscribers in June 2011. Then after it was increased to 53.33 per cent in the year 2011-12 and

almost the same trend was continued up to 2015-16. The Reliance continued its CDMA services up to 2015-16. From the year 2016-17 onwards the company migrated its 24 million CDMA users to 4G LTE, freeing the 850 MHz band for 4G LTE services.

Tata Tele services market share was 35.58 per cent in the year 2007-08 and it reached to 37.47 per cent in the year 2010-11 and its market share was stood at around 28 per cent in the year 2011-12 and 2012-13. Then after it was increased to 21.33 per cent in the year 2013-14 subsequently it was continuously declined to 27.19 per cent to 25.15 per cent in the year 2014-15 and 2015-16 respectively. But in the year 2016-17 Tata CDMA service market share was abnormally increased to 54.83 per cent because of stoppage of the Reliance CDMA services. It also caused for the abnormal increase of Shyam Telelink/Sistema CDMA services market share to 39.01 per cent.

The market share of BSNL CDMA services were also considerably increased to 6.16 per cent in the year 2016-17 when compared to 2.61 per cent in the year 2015-16. The CDMA services of MTNL and HFCL are very insignificant and their market share was zero from 2014-15 onwards. Therefore it can be concluded that Reliance placed at dominate position up to 2015-16. From 2016-17 onwards Tata Teleservices occupied more than 50 per cent of market share of CDMA services.

COMPARISON OF WIRELINE AND WIRELESS TELEPHONE SUBSCRIBERS:

In the early days only Government owned BSNL and MTNL were allowed to provide wireline phone services. Due to the rapid growth of the cellular phone industry in India, wirelines are facing stiff competition from cellular operators, with number of wireline subscribers fell from 39.42 Million in the year 2007-08 to 24.40 Million in the year 2016-17. This has forced wireline service providers to become more efficient and improve their quality of services. Wireless subscriber base was increased from 261.07 Million in the year 2007-08 to 1170.18 Million in the 2016-17. The increased trend in the wireless subscribers is caused for the decreased trend of wireline telephone subscribers. The year wise data representing urban and rural wireline and wireless telephone subscribers is presented in the following Table – 9.

Results and Discussion:

It is noticed that the percentage of wireline and wireless rural subscribers is much lesser than the urban subscribers. It is the common phenomenon in the entire study. The wireline telephone subscribers were 27.78 Million in the year 2007-08, it was slowly declined year after year and reached to 20.55 Million in the year 2016-17. There is a clear cut declining trend was emerged in the urban wireline telephone subscribers. Similarly the same trend was also identified in the rural wireline telephone subscribers.

In case of wireless subscribers there was a continuous and abnormal increase is notified. The urban wireless telephone subscribers ranged from 196.21 Million in the year 2007-08 to 672.42 Million in the year 2016-17. On the other hand rural wireless telephone subscribers increased from 64.86 Million in the year 2007-08 to 497.76 Million in the year 2016-17. Thus there was a very clear increasing trend identified in the wireless telephone subscribers during period under review. It can be concluded that the total abnormal growth rate in wireless telephone subscribers is caused for the total abnormal decline in the wireline telephone subscribers. Based on this trend and technology up gradation it can be said that there will be no wireline subscribers in the near future.

THE EMERGENCE OF INTERNET SERVICE:

The Internet is the global system of interconnected computer networks that use the Internet Protocol suite (TCP/IP) to link devices worldwide. It is a network of networks that consists of private, public, academic, business, and government networks of local to global scope, linked by a broad array of electronic, wireless, and optical networking technologies. The Internet carries a vast range of information resources and services, such as the inter-linked hypertext documents and applications of the World Wide Web (WWW), electronic mail, telephony, and file sharing.

The history of the internet in India began with the launch of the Educational Research Network (ERNET) in 1986. The network was only made available to educational and research communities. ERNET was initiated by the Department of Electronics (DoE), with funding support from the Government of India and United Nations Development Program (UNDP), involving eight premier institutions as participating agencies—NCST Bombay, Indian Institute of Science, five Indian Institutes of Technology at Delhi, Mumbai, Kanpur, Kharagpur and Chennai, and the DoE in New Delhi. ERNET began as a multi-protocol network with both the TCP/IP and the OSI-IP protocol stacks running over the leased-line portion of the backbone. Since 1995, however, almost

all traffic is carried over TCP/IP. The first leased line of 9.6 kbit/s was installed in January 1991 between Delhi and Mumbai. ERNET was allotted Class B IP address 144.16.0.0 by Inter NIC in 1990. Subsequently, Class C addresses were allotted to ERNET by APNIC. All IITs, IISc Bangalore, DOE Delhi and NCST Mumbai were connected by 9.6 kbit/s leased line by 1992. In the same year, 64 kbit/s Internet gateway link was commissioned from NCST Mumbai to UUNet in Virginia, United States.

The Internet services were launched in India on 15th August, 1995 by Videsh Sanchar Nigam Limited through dial-up access with speeds of up to 9.6 kilobits per second (Kbps). They were able to add about 10,000 Internet users within 6 months. The Integrated Services Digital Network (ISDN) access was introduced in 1997.In November, 1998, the Government opened up the sector for providing Internet services by private operators. A liberal licensing regime was put in place with a view to increase Internet penetration across the country. The New Telecom Policy 1999 envisaged opening up of internet Telephony where upon Government decided to permit ISPs to process and carry voice signals (Restricted Internet Telephony) with effect from 1st April 2002. However, after 10 years the Internet experience in the country remained less attractive with narrow-band connections having speeds less than 56 kbit/s (dial-up). In 2004, the government formulated its broadband policy which defined broadband as "an always-on Internet connection with download speed of 256 kbit/s or above. From 2005 onward the growth of the broadband sector in the country accelerated, but remained below the growth estimates of the government and related agencies due to resource issues in last-mile access which were predominantly wired-line technologies. This bottleneck was removed in 2010 when the government auctioned 3G spectrum followed by an equally high-profile auction of 4G spectrum that set the scene for a competitive and invigorated wireless broadband market. Now Internet access in India is provided by both public and private companies using a variety of technologies and media including dial-up (PSTN), xDSL, coaxial cable, Ethernet, FTTH, ISDN, HSDPA (3G), 4G, Wi-Fi, Wi-MAX, etc. at a wide range of speeds and costs.

According to the Internet and Mobile Association of India (IAMAI), the Internet user base in the country stood at 190 million at the end of June, 2013, which rose to 378.10 million in January 2018. Cumulative Annual Growth Rate (CAGR) of broadband during the five-year period between 2005 and 2010 was about 117 per cent. There were 204 Internet Service Providers (ISPs) offering broadband services in India as of 31 December 2017. As of January 2018, the top five ISPs in terms subscriber base were Reliance Jio with 168.39 Million, Bharti Airtel with 75.01 Million, Vodafone with 54.83 Million, Idea Cellular with 37.33 Million and BSNL with 21.81 Million. In 2009, about 37 per cent of the users access the Internet from cyber cafes, 30 per cent from an office, and 23 per cent from home. However, the number of mobile Internet users increased rapidly from 2009 onwards and there were about 359.80 million mobile users at the end of January 2018, with a majority using 4G mobile networks.

One of the major issues facing the Internet segment in India is the lower average bandwidth of broadband connections compared to that of developed countries. According to 2007 statistics, the average download speed in India hovered at about 40 KB per second (256 kbit/s), the minimum speed set by TRAI, whereas the international average was 5.6 Mbit/s during the same period. In order to attend this infrastructure issue the government declared 2007 as "the year of broadband". To compete with international standards of defining broadband speed the Indian Government has taken the aggressive step of proposing a $13 billion national broadband network to connect all cities, towns and villages with a population of more than 500 in two phases targeted for completion by 2012 and 2013. The network was supposed to provide speeds up to 10 Mbit/s in 63 metropolitan areas and 4 Mbit/s in an additional 352 cities. In February 2018, the average broadband speed of fixed line connection in India was 20.72 mbps, which is less than the global average download speed of 42.71 mbps. In terms of mobile internet speed, India performed quite poorly, with average speed of 9.01 mbps when compared with global average mobile broadband speed was 22.16 mbps.

As of December 2017, according to Internet and Mobile Association of India, the Internet penetration rate in India is one of the lowest in the world and only accounts for 35 per cent of the population compared to the global average internet penetration is over 54.4 per cent. Another issue is the digital divide where growth is biased in favour of urban areas; according to December 2017 statistics, internet penetration in urban India was 64.84 per cent, whereas internet penetration in rural India is only 20.26 per cent. Regulators have tried to boost the growth of broadband in rural areas by promoting higher investment in rural infrastructure and establishing subsidized tariffs for rural subscribers under the Universal service obligation scheme of the Indian government. As of May 2014, the Internet was delivered to India mainly by 9 different undersea fibres, including SEA-ME-WE 3, Bay of Bengal Gateway and Europe India Gateway, arriving at 5 different landing points. The Table – 10 shows the changing pattern of Internet subscribers and its growth rate in India for the period of ten years from 2007-08 to 2016-17.

Results and Discussion:
It is evident that the wireline internet subscribers were 11.09 Million in the year 2007-08 and continuously increasing the number of subscribers year to year up to 2011-12 with an average annual growth rate of 19.85 per cent from 2008-09. Then after in the year 2012-13 and 2013-14 the wireline subscribers declined by 5.47 per cent and 14.39 per cent respectively. Again from 2014-15 onwards there was a slight increase of wireline internet subscribers and moved from 19.06 Million to 21.57 Million during the study period. The wireless internet subscribers were 66.09 Million in the year 2007-08. There was a continuous increasing trend in wireless internet subscribers year after year up to 2011-12 with an average annual growth rate of 65.34 per cent from the year 2008-09. Then after there was a decline of 68.10 per cent of wireless subscribers in the year 2012-13 due to cancellation of large number licences of operators by the Government of India in direction of Supreme court. From the year 2013-14 there was a continuous increasing trend in the wireless internet subscribers up to 2016-17 with an average annual growth rate of 30.60 per cent.
The total internet subscribers in the year 2007-08 were 77.18 Million, out of which 85.63 per cent were wireless internet subscribers and 14.37 per cent were wireline internet subscribers. The wireless internet services attracted more number of internet users when compare to wireline internet services in the entire period of the study. The percentage of wirline internet subscribers declined from 14.37 per cent to 5.11 per cent, whereas the wireless internet subscribers increased from 85.63per cent to 94.89 per cent during the period under review. Therefore it can concluded that the wireline internet subscribers are diminishing year after year and the in near future there will be no wireline internet subscribers.

Market Share of Wireline Internet Service Providers:
The wireline internet services are offering with different technologies i.e., DSL, Dial-up, Ethernet/LAN, Cable modem, Fiber and Leased line. Access network in India is mainly based on copper loops, coaxial cables and microwave so far. Today 61.89 per cent of the broadband connections are on DSL technology using copper lines, 14.88 per cent with Dial-up, 14.09 per cent with Ethernet/LAN, 6.95 per cent with cable modem, 1.80 per cent with Fiber and 0.39 per cent with Leased line. xDSL technology is limited to line speeds of up to 24 Mbps and a channel on the cable can have a bit rate of 30 Mbps or more. These networks also need substantial investments to upgrade them to provide high speed broadband as legacy copper networks would need conditioning to make them fit for DSL access and most of the cable TV networks in India are one way. Nevertheless, they could, in principle be used in combination to deliver the most cost effective solution in the short term, avoiding the prohibitive costs associated with universal FTTH access. The total wireline internet subscribers at the end of March, 2017 is 21.58 Million of which Broadband is 18.24 million and Narrowband is 3.33 million. BSNL holds the highest subscriber base with 13.17 million in wired internet segment, followed by Bharathi Airtel 2.08 million, Atria Convergence Tech 1.17 million, MTNL 1.01 million, You Broadband 0.64 million and others with 3.51 million. The market share of wired internet service providers is presented in the Table -11.

Results and Discussion:
It is observed that more than 50 per cent of market share occupied by the BSNL in the entire period of the study. Its market share moved from 50.86 per cent in the year 2007-08 to 71.32 per cent in the year 2013-14. Whereas the market share of MTNL continuously declined from year to year and moved from 17.13 per cent in the year 2007-08 to 4.7 per cent in the year 2016-17. The market share of Bharati Airtel stood at 7.35 per cent in the year 2007-08 and moved to 9.66 per cent in the year 2016-17. Thus it can be concluded that Airtel market share was almost constant at 8 to 9 per cent during the period. Similarly the Reliance market share moved from 6.28 per cent in the year 2007-08 to 11.53 per cent in the year 2012-13. The Reliance has stopped its wireline internet services from the year 2013-14 onwards. In case of Tata wireline service providers, there market share was negligible from 2008-09 to 2012-13.From 2013-14 onwards, Tata internet service providers also stopped their wireline internet services. Whereas the other miscellaneous wireline internet service providers moved from 10.86 per cent in the year 2010-11 to 24.58 per cent in the year 2016-17.

Market Share of Wireless Internet Service Providers:
Wireless broadband has been mostly accessed on mobiles and dongles so far contributing to more than 92 per cent broadband connections. 2G technologies - GPRS and EDGE have the maximum coverage and adoption while 3G technologies; HSPA, WCDMA, CDMA 1x, EVDO had limited adoption. The technology wise broadband subscriber base as on 31.03.2017 is 35.51 per cent with GPRS/EDGE, 32.28 per cent with

LTE/FW_LTE, 31.52 per cent with HSPA/WCDMA, 0.35 per cent with HSD/HSIA/WiFi, 0.33 per cent with EVDO/CDMA and 0.01 per cent with Radio/Wi-Max/VSAT. Despite the availability of data plans providing Internet access to mobile users, a significant portion of traffic from mobile devices has moved to Wi-Fi connections to save on data plan fees or need for higher and faster data transmission capacities. The licensed service providers are rolling out 4G across the country to provide high speed data services. However, India has been lagging behind in deploying next generation technologies like 5G and FTTH, which can provide high capacity broadband access required by the data hungry multi-media smart applications. These advanced technologies also require substantial investments simply to make them available in the more accessible, densely populated urban regions. Also the spectrum allocated in India for 3G and 4G services is not enough to cater to the growing demand for data services by the urban areas and the expected future demand of the rural communities. There are 154 internet service providers in 22 circles in India at the end of March, 2017. The total wireless internet subscribers are 400.61 million at the end of March, 2017 of which 0.58 million subscribers are provided internet with Wi-Fi, Wi-max, Radio& VSAT. The market share of internet service providers are presented in the Table – 12.

Results and Discussion:

It is observed that Bharti Airtel is flagship wireless internet service providers from the year 2009-10 to 2015-16. Its market share was moved from 38.35 per cent in the year 2009-10 to 31.57 per cent in the year 2010-12, then after it was increased to 39.86 per cent in the year 2011-12. In the year 2012-13 it was declined to 27.58 per cent and the same trend was continued and declined to 21.30 per cent in the year 2016-17. In case of BSNL their market share was registered at 27.63 per cent, 19.27 per cent and 18.22 per cent in the year 2009-10, 2010-11 and 2011-12 respectively. According to TRAI report the BSNL and MTNL were not submitted their reports in the year 2012-13, hence their market share was treated as zero. In the 2013-14 the market share of BSNL is only 11.72 per cent then after it has been continuously declined to 5.64 per cent in the year 2016-17. The market share of MTNL very negligible. In case of Vodafone its market share was moved from 18.32 per cent in the year 2009-10 to 24.03 per cent in the year 2012-13. Then after it was a continuous decline and reached to 16.69 per cent in the year 2016-17. The market share of Idea moved from 3.35 per cent in the year 2010-11 to 17.80 per cent in the year 2012-13, then after there is slight fluctuations in its market share and reached to 10.55 per cent in the year 2016-17. The Reliance market share was moved from 2.43 per cent in the year 2011-12 to 16.13 per cent in the year 2013-14, then after it was declined to around 7 per cent in the year 2013-14 and continued the same up to 2015-16. In the year 2016-17 the Reliance market share was registered at 7.09 per cent only. But in the same year Reliance Jio entered in to the market and occupied a major share of 27.13 per cent. The Aircel market share moved from 1.23 per cent in the year 2009-10 to 8.47 per cent in the year 2012-13, then after it was registered around 7 per cent from 2013-14 to 2015-16. The market share of Aircel was registered at 4.43 per cent in the year 2016-17, the market share of Tata is registered at high of 7.72 per cent in the year 2010-11 and it was declined to 3.32 per cent in the year 2016-17. In case of Telenor as it entered in to the market lately its market share was stood at 4.24 per cent and 3.22 per cent in the year 2015-16 and 2016-17 respectively. In case of Unitech, it appeared in the market only for the year 2010-11, 2011-12 and 2012-13 with the market share of 5.98 per cent, 9.45 per cent and 2.60 per cent respectively. In case of the market share of other wireless internet service providers stood at the highest of 6.28 per cent in the year 2014-15 and the lowest at 0.39 per cent in the year 2016-17. Based on the above analysis it can be concluded that out of the various wireless internet service providers the Reliance Jio will become the prime wireless internet service provider in the future.

TELE-DENSITY IN INDIA:

The number of telephone connections per 100 population in a specified geographic area is called the Tele-density. It is an indicator of telecom penetration in the country. The governments of many emerging economies are focused on increasing Tele-density as an economic enabler. Even though the Tele-density has improved substantially during the last decade, it is still low as compared with China. Thus, there is a huge untapped potential existing for the telecom operators in India. While the Tele-density in India has improved substantially, there is a stark difference between the Tele-density of the urban and rural areas. The urban Tele-density has improved substantially. While the Tele-density in the metros is rapidly reaching saturation point, the future growth in urban areas is expected to come from non-metros. The Tele-density of the rural areas has also improved substantially during the last decade. In fact the significant improvement in the rural Tele-density has been primarily backed by the surge in wireless services in the rural areas. When looking at total Tele-density (fixed and mobile connections), we observe that the gap between urban and rural Tele-density has steadily

increased. The benefits of telecommunications growth seem to be mainly captured by wealthier and urban customers.

Over the years many initiatives have been taken by the central and state governments, telecom operators, NGOs, among others, for increasing the spread of telecommunication in the rural areas. Along with Village Public Telephones (VPTs), a scheme of Rural Community Phones (RCP) has been launched under the Universal Service Obligation fund to create telecom infrastructure in rural and remote areas. Further, the Mobile Grameen Sanchar Sewak Scheme that provide telephones at the doorstep of the villagers is functional in about 12,000 villages and is likely to facilitate growth of mobile services in the rural areas. Increasing penetration through creation of a Universal Service Obligations Fund (USOF) that supported a variety of initiatives for sharing of infrastructure, developing infrastructure for mobile services in rural areas, etc., was a major policy measure towards increasing the reach of telecom services in the rural areas. Although the Tele-density in the rural India has grown, yet the rural areas still remain underpenetrated to a large extent. The factors responsible for low growth of mobile services in rural areas includes large agricultural workforce, low per capita income, low literacy rates. The Table – 13 data is describes, the Tele -density percentage on different parameters viz wire line, wireless, rural and urban.

Results and Discussion:

The data related to Tele-density in India indicates that the wireline Tele-density both in urban and rural showing declining trend during the period under review whereas the wireless urban and rural Tele-density indicating increasing trend year after year, it is an exponential growth of Tele-density in India due to the rapid evolution of high-tech wireless technologies. It is noticed that the overall Tele-density in India is 92.98 per cent whereas the Urban and Rural Tele-density is 171.81 per cent and 56.91 per cent at the end of March, 17. There is a large disparity between the urban and rural Tele-density. The slow growth in Tele-density in the rural areas is due to these areas being less attractive for the telecom service providers. Because providing telecom services in the remote and rural areas, they requires massive investment. Rapid increase in rural Tele-density is very important for the economic and social development of rural areas, which will help in the overall development of the country. The Government of India as employed several measures for spreading up of mobile network in the distant rural areas. Particularly private telecom operators are trying their level best to expand their services in rural areas by providing them good and effective services.

MOBILE NUMBER PORTABILITY (MNP):

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 and has issued a separate License for MNP service w.e.f. 20.03.2009. The Department of Telecommunication (DoT) has already issued licenses to two global companies such as M/s Syniverse Technologies Pvt. Ltd. and M/s MNP Interconnection Telecom Solutions India Pvt. Ltd. for implementing the service. MNP is to be implemented in whole country in one go by 31.10.2010. Intra-service area Mobile number portability (MNP) was implemented first in Haryana service area w.e.f. 25.11.2010 and in the rest of the country w.e.f. 20.01.2011. Inter-Service Area MNP has been implemented in the country w.e.f. 03.07.2015. Now, the wireless telephone subscribers can retain their mobile numbers when they relocate from one service area to another. The detailed zone wise MNP status is given in the Table – 14.

Results and Discussion:

It reveals that during the month of Nov-2017, a total of 15.99 Million requests were received for MNP. With this, the cumulative MNP requests increased from 314.99 Million at the end of Oct-17 to 330.98 Million at the end of Nov-17, since the implementation of MNP. In MNP Zone-I which includes Northern and Western India, the highest number of requests till date have been received in Rajasthan about 27.54 Million followed by Gujarat about 23.33 Million. In MNP Zone-II includes Southern and Eastern India, the highest number of requests till date have been received in Karnataka about 34.36 Million followed by Andhra Pradesh about 29.21 Million.

CONCLUSIONS :

The percentage of rural wireline subscribers is in decreased trend. It is due to the massive usage of mobile phones with lower tariffs offered by various private telecom service providers in the rural areas. The relationship between urban and rural wireline subscribers is inverse. Even after a stiff competition from various private sector operators the BSNL and MTNL continuing their dominating their market share in overall India in general and Delhi and Mumbai in particular. Among the total PCOs the BSNL connections are much more than the all other PCOs connections in the entire study period. There is declined trend in urban wireless subscribers, contrary to this there is an increased trend in case of rural wireless subscribers. The total abnormal growth rate in wireless telephone subscribers is caused for the total abnormal decline in the wireline telephone subscribers. Based on this trend and technology up gradation it can be said that there will be no wireline subscribers in the near future. The Tele-density in the rural India has grown, yet the rural areas still remain underpenetrated to a large extent. The factors responsible for low growth of mobile services in rural areas includes large agricultural workforce, low per capita income, low literacy rates. The Government of India as employed several measures for spreading up of mobile network in the distant rural areas. Particularly private telecom operators are trying their level best to expand their services in rural areas by providing them good and effective services.

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Table 1: Urban and Rural Wireline Telephone Subscribers

(In Million)

Year	Urban Wireline Subscribers	Rural Wireline Subscribers	Total	Growth Rate
2007-08	27.78 (70.47)	11.64 (29.53)	39.42 (100)	0
2008-09	27.38 (72.13)	10.58 (27.87)	37.96 (100)	-3.70
2009-10	27.03 (73.13)	9.93 (26.87)	36.96 (100)	-2.63
2010-11	26.04 (74.98)	8.69 (25.02)	34.73 (100)	-6.03
2011-12	24.62 (76.53)	7.55 (23.47)	32.17 (100)	-7.37
2012-13	23.50 (77.79)	6.71 (22.21)	30.21 (100)	-5.61
2013-14	22.54 (79.09)	5.96 (20.91)	28.50 (100)	-6.09
2014-15	21.47 (80.74)	5.12 (19.26)	26.59 (100)	-6.70
2015-16	20.90 (82.87)	4.32 (17.13)	25.22 (100)	-5.15
2016-17	20.55 (84.22)	3.85 (15.78)	24.40 (100)	-3.25

Source: Various issues of TRAI Quarterly Reports.
Note: Figures in bracket are percent to total

Table 2: Market Share of Wireline Connections of Service Providers

Year	Share of BSNL (in per cent)	Share of MTNL (in per cent)	Share of Other Private Operators (in per cent)	Total
2007-08	80.05	9.33	10.62	100
2008-09	77.30	9.41	13.29	100
2009-10	75.31	9.46	15.23	100
2010-11	72.63	9.97	17.4	100
2011-12	69.84	10.75	19.41	100
2012-13	67.67	11.45	20.88	100
2013-14	64.90	12.39	22.71	100
2014-15	61.71	13.35	24.94	100
2015-16	58.52	13.89	27.59	100
2016-17	56.10	14.19	29.71	100

Source: Various issues of TRAI Quarterly Reports.

Table 3: The Particulars of Public Call Office

(In Nos.)

Year	BSNL	MTNL	Bharathi Airtel	Reliance	TATA	HFCL	Shyam	Total	Growth Rate
2007-08	2051518 (33.17)	239335 (3.87)	202450 (3.27)	2045500 (33.07)	1568607 (25.36)	36794 (0.59)	41700 (0.67)	6185904 (100)	0
2008-09	1877452 (30.26)	215627 (3.48)	173327 (2.79)	2135903 (34.43)	1738341 (28.02)	27924 (0.45)	35592 (0.57)	6204166 (100)	0.30
2009-10	1654076 (36.00)	195430 (4.25)	150704 (3.28)	1414444 (30.78)	1136658 (24.74)	19669 (0.43)	23720 (0.52)	4594701 (100)	-25.94

Year	BSNL	MTNL	Bharathi Airtel	Reliance	TATA	HFCL	Shyam	Total	Growth Rate
2010-11	1393514 (41.80)	180000 (5.40)	70000 (2.10)	680000 (20.40)	980000 (29.40)	10000 (0.30)	20000 (0.60)	3333514 (100)	-27.45
2011-12	1075728 (53.63)	160000 (7.98)	50000 (2.49)	230000 (11.47)	460000 (22.93)	10000 (0.50)	20000 (1.00)	2005728 (100)	-39.83
2012-13	795946 (63.07)	150000 (11.89)	36000 (2.85)	121000 (9.59)	142000 (11.25)	4000 (0.32)	13000 (1.03)	1261946 (100)	-37.08
2013-14	614988 (64.27)	143000 (14.94)	27000 (2.82)	77000 (8.05)	80000 (8.36)	3000 (0.31)	12000 (1.25)	956988 (100)	-24.17
2014-15	465855 (63.22)	139000 (18.86)	23000 (3.12)	49000 (6.65)	47000 (6.38)	3000 (0.41)	10000 (1.36)	736855 (100)	-23.00
2015-16	355936 (60.44)	134000 (22.75)	17000 (2.89)	30000 (5.09)	40000 (6.79)	2000 (0.34)	10000 (1.70)	588936 (100)	-20.07
2016-17	278036 (61.51)	128000 (28.32)	15000 (3.32)	0 (0)	19000 (4.20)	2000 (0.44)	10000 (2.21)	452036 (100)	-23.25

Source: Various issues of TRAI Quarterly Reports.
Note: The figures in bracket are per cent to total.

Table 4: The Village Public Telephones

(In Nos.)

Year	BSNL	TATA	HFCL	SHYAM	Others	Total	Growth Rate
2007-08	519616 (92.87)	32463 (5.80)	299 (0.05)	3010 (0.54)	4115 (0.74)	559503 (100)	0
2008-09	549294 (97.99)	3900 (0.70)	220 (0.04)	3010 (0.54)	4115 (0.73)	560539 (100)	0.19
2009-10	569391 (98.82)	3625 (0.63)	164 (0.03)	3010 (0.52)	0 (0)	576190 (100)	2.79
2010-11	577978 (98.85)	3625 (0.62)	119 (0.02)	3010 (0.51)	0 (0)	584732 (100)	1.48
2011-12	578389 (99.08)	2267 (0.39)	52 (0.01)	3010 (0.52)	0 (0)	583718 (100)	-0.17
2012-13	577882 (98.01)	2267 (0.39)	27 (0.01)	3010 (0.51)	5726 (1.08)	589631 (100)	1.01
2013-14	581924 (98.81)	3953 (0.67)	25 (0.01)	3010 (0.51)	0 (0)	588912 (100)	-0.12
2014-15	581183 (99.19)	1786 (0.30)	0 (0)	3010 (0.51)	0 (0)	585981 (100)	-0.5
2015-16	582482 (99.26)	1305 (0.22)	0 (0)	3010 (0.51)	2 (0.00)	586799 (100)	0.14
2016-17	228403 (99.44)	1282 (0.56)	0 (0)	0 (0)	0 (0)	229685 (100)	-60.86

Source: Various issues of TRAI Quarterly Reports.
Note: The figures in brackets are per cent to total

Table 5: Wireless Telephone Subscribers in Urban and Rural

(In Millions)

Year	Urban Wireless Subscribers	Rural Wireless Subscribers	Total	Growth Rate
2007-08	196.21 (75.16)	64.86 (24.84)	261.07 (100)	0
2008-09	282.05 (72.00)	109.71 (28.00)	391.76 (100)	50.06
2009-10	393.45 (67.33)	190.88 (32.67)	584.33 (100)	49.16
2010-11	538.05 (66.30)	273.54 (33.70)	811.59 (100)	38.89
2011-12	595.90 (64.83)	323.27 (35.17)	919.17 (100)	13.26
2012-13	525.30 (60.53)	342.50 (39.47)	867.80 (100)	-5.59
2013-14	532.73 (58.90)	371.78 (41.10)	904.51 (100)	4.23
2014-15	555.71 (57.30)	414.18 (42.70)	969.89 (100)	7.23
2015-16	588.79 (56.96)	444.84 (43.04)	1033.63 (100)	6.57
2016-17	672.42 (57.46)	497.76 (42.54)	1170.18 (100)	13.21

Source: Various issues of TRAI Quarterly Reports.
Note: Figures in bracket are percent to total.

Table 6: GSM and CDMA Subscriber Base (In Million)

Year	GSM Subscribers	CDMA Subscribers	Total Subscribers
2007-08	192.70 (73.81)	68.37 (26.19)	261.07 (100)
2008-09	297.26 (75.88)	94.50 (24.12)	391.76 (100)
2009-10	478.68 (81.92)	105.64 (18.08)	584.32 (100)
2010-11	698.37 (86.05)	113.22 (13.95)	811.59 (100)
2011-12	814.06 (88.56)	105.11 (11.44)	919.17 (100)
2012-13	794.03 (91.50)	73.78 (8.50)	867.81 (100)
2013-14	847.41 (93.69)	57.10 (6.31)	904.51 (100)
2014-15	917.73 (94.62)	52.16 (5.38)	969.89 (100)
2015-16	989.54 (95.73)	44.09 (4.27)	1033.63 (100)
2016-17	1157.59 (98.92)	12.59 (1.08)	1170.18 (100)

Source: Various issues of TRAI Quarterly Reports.
Note: The figures in brackets are per cent to total

Table 7: Market Share of GSM Service Providers

(In Per cent)

Year	BSNL	MTNL	Bharati Airtel	Vodafone	Idea	Reliance	Aircel/ Disnet	Tata	Reliance Jio	Others	Total
2007-08	18.80	1.68	32.16	22.90	12.46	3.64	5.51	0	0	2.85	100
2008-09	15.71	1.41	31.6	23.13	13.08	6.73	6.22	0	0	2.12	100
2009-10	13.22	1.00	26.66	21.07	13.33	9.69	7.70	5.62	0	1.71	100
2010-11	12.35	0.74	23.23	19.27	12.82	11.61	7.85	6.69	0	5.44	100
2011-12	11.61	0.69	22.27	18.48	13.85	11.91	7.69	6.48	0	7.02	100
2012-13	12.41	0.61	23.70	19.19	15.32	10.62	7.57	5.81	0	4.77	100
2013-14	10.90	0.38	24.24	19.66	16.02	9.67	8.28	5.46	0	5.39	100
2014-15	8.20	0.37	24.63	20.03	17.20	8.98	8.87	5.68	0	6.04	100
2015-16	8.61	0.36	25.39	20.00	17.69	7.91	8.80	4.95	0	6.29	100
2016-17	8.66	0.31	23.64	18.06	16.88	7.21	7.85	3.64	9.39	4.36	100

Source: Various issues of TRAI Quarterly Reports.

Table 8: Market Share of CDMA Service Providers

(In percent)

Year	BSNL	MTNL	Tata Tele services	Reliance	HFCL	Shyam Telelink/ Sistema	Total
2007-08	6.70	0.41	35.58	56.71	0.44	0.16	100
2008-09	5.76	0.32	37.16	55.72	0.41	0.63	100
2009-10	5.82	0.29	36.95	53.06	0.31	3.57	100
2010-11	4.92	0.25	37.47	48.27	0.21	8.88	100
2011-12	3.81	0.24	27.56	53.33	0.03	15.03	100
2012-13	3.66	0.24	27.49	52.44	0.02	16.15	100
2013-14	3.94	0.22	29.31	50.70	0.01	15.83	100
2014-15	3.81	0.17	27.19	51.84	0.00	16.99	100
2015-16	2.61	0.00	25.15	54.79	0.00	17.44	100
2016-17	6.16	0.00	54.83	0.00	0.00	39.01	100

Source: Various issues of TRAI Quarterly Reports.

Table 9: Wireline and Wireless Telephone Subscribers

(In Million)

Year	Wireline			Wireless			Total (wireline+wireless)			Growth Rate
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	
2007-08	27.78 (70.47)	11.64 (29.53)	39.42 (100)	196.21 (75.16)	64.86 (24.84)	261.07 (100)	223.99 (74.54)	76.5 (25.46)	300.49 (100)	0
2008-09	27.38 (72.13)	10.58 (27.87)	37.96 (100)	282.05 (72.00)	109.71 (28.00)	391.76 (100)	309.43 (72.01)	120.29 (27.99)	429.72 (100)	43.01
2009-10	27.03 (73.13)	9.93 (26.87)	36.96 (100)	393.45 (67.33)	190.88 (32.67)	584.33 (100)	420.48 (67.68)	200.81 (32.32)	621.29 (100)	44.58
2010-11	26.04 (74.98)	8.69 (25.02)	34.73 (100)	538.05 (66.30)	273.54 (33.70)	811.59 (100)	564.09 (66.65)	282.23 (33.35)	846.32 (100)	36.22
2011-12	24.62 (76.53)	7.55 (23.47)	32.17 (100)	595.90 (64.83)	323.27 (35.17)	919.17 (100)	620.52 (65.23)	330.82 (34.77)	951.34 (100)	12.41
2012-13	23.50 (77.79)	6.71 (22.21)	30.21 (100)	525.30 (60.53)	342.50 (39.47)	867.80 (100)	548.8 (61.11)	349.21 (38.89)	898.01 (100)	-5.61

Year	Wireline			Wireless			Total (wireline+wireless)			Growth Rate
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	
2013-14	22.54 (79.09)	5.96 (20.91)	28.50 (100)	532.73 (58.90)	371.78 (41.10)	904.51 (100)	555.27 (59.51)	377.74 (40.49)	933.01 (100)	3.9
2014-15	21.47 (80.74)	5.12 (19.23)	26.59 (100)	555.71 (57.30)	414.18 (42.70)	969.89 (100)	577.18 (57.92)	419.3 (42.08)	996.48 (100)	6.80
2015-16	20.90 (82.87)	4.32 (17.13)	25.22 (100)	588.79 (56.96)	444.84 (43.04)	1033.63 (100)	609.69 (57.58)	449.16 (42.42)	1058.85 (100)	6.26
2016-17	20.55 (84.22)	3.85 (15.78)	24.40 (100)	672.42 (57.46)	497.76 (42.54)	1170.18 (100)	692.97 (58.01)	501.61 (41.99)	1194.58 (100)	12.82

Source: Various issues of TRAI Quarterly Reports.
Note: The figures in brackets are per cent to total

Table 10:The Changing Pattern of Internet Subscribers and Growth Rate

(in Millions)

Year	Wireline	Wireless	Total	Growth Rate
2007-08	11.09 (14.37)	66.09 (85.63)	77.18(100)	-
2008-09	13.54 (10.31)	117.82 (89.69)	131.36(100)	70.20
2009-10	16.18 (8.34)	177.87 (91.66)	194.05(100)	47.72
2010-11	19.67 (4.90)	381.4 (95.10)	401.07(100)	106.68
2011-12	22.86 (4.85)	448.89 (95.15)	471.75(100)	17.62
2012-13	21.61 (13.11)	143.20 (86.89)	164.81(100)	-65.06
2013-14	18.50 (7.35)	233.09 (92.65)	251.59(100)	52.65
2014-15	19.06 (6.30)	283.29 (93.70)	302.35(100)	20.18
2015-16	20.44 (5.97)	322.21 (94.03)	342.65(100)	13.33
2016-17	21.57 (5.11)	400.62 (94.89)	422.19(100)	23.21

Source: Various issues of TRAI Quarterly Reports.
Note: The figures in brackets are per cent to total

Table 11: Market Share of Wireline Internet Service Providers

(In Per cent)

Year	BSNL	MTNL	Bharati Airtel	Reliance	Tata	Others	Total
2007-08	50.86	17.13	7.35	6.28	0	18.38	100
2008-09	53.59	15.69	8.01	6.91	2.7	13.08	100
2009-10	56.77	14.29	8.07	7.56	1.7	11.61	100
2010-11	57.53	12.32	7.29	11.05	0.9	10.86	100
2011-12	55.32	11.13	6.04	15.65	0.8	11.07	100
2012-13	60.73	9.06	6.47	11.53	0.6	11.62	100
2013-14	71.32	6.09	7.96	0	0	14.63	100
2014-15	68.98	5.97	7.97	0	0	17.08	100
2015-16	64.27	5.42	8.95	0	0	21.36	100
2016-17	61.06	4.7	9.66	0	0	24.58	100

Source: Various issues of TRAI Quarterly Reports.

Table 12: The Market Share of Wireless Internet Service Providers

(In Per cent)

Year	BSNL	MTNL	Bharati Airtel	Vodafone	Idea	Reliance	Aircel	Telenor	Tata	Unitech	Reliance Jio	Others	Total
2009-10	27.63	0.23	38.35	18.32	4.80	6.16	1.23	0.00	0.50	0.00	0.00	2.78	100
2010-11	19.27	0.78	31.57	15.94	3.35	7.38	2.08	0.00	7.72	5.98	0.00	5.95	100
2011-12	18.22	1.05	39.86	16.28	4.19	2.43	3.70	0.00	1.08	9.45	0.00	3.74	100
2012-13	0.00	0.00	27.58	24.03	17.80	14.57	8.47	0.00	1.91	2.60	0.00	3.05	100
2013-14	11.72	0.28	24.86	22.31	10.82	16.13	6.99	0.00	1.34	0.00	0.00	5.54	100
2014-15	6.66	0.29	26.40	22.51	11.80	11.96	6.87	0.00	7.23	0.00	0.00	6.28	100
2015-16	6.50	0.27	27.53	20.97	13.67	12.11	6.97	4.24	6.53	0.00	0.00	1.22	100
2016-17	5.64	0.25	21.30	16.69	10.55	7.09	4.43	3.22	3.32	0.00	27.13	0.39	100

Source: Various issues of TRAI Quarterly Reports.
Note: BSNL, MTNL, Quadrant and Videocon have not provided their reports for the financial year 2012-13.

Table 13: The Changing Pattern of Tele Density in India

Year	Wireline			Wireless			Total		
	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
2007-08	8.43	1.31	3.44	51.45	10.60	22.78	66.39	9.46	26.22
2008-09	8.01	1.25	3.27	76.14	15.69	33.71	88.66	14.80	36.98
2009-10	7.70	1.20	3.14	112.03	23.09	49.60	119.73	24.29	52.74
2010-11	7.26	1.04	2.91	150.06	32.75	67.98	157.32	33.79	70.89
2011-12	6.73	0.89	2.66	162.82	38.33	76.00	169.55	39.22	78.66
2012-13	6.29	0.79	2.47	140.67	40.23	70.85	146.96	41.02	73.32
2013-14	5.92	0.69	2.30	139.86	43.27	72.94	145.78	43.96	75.23
2014-15	5.53	0.59	2.12	143.08	47.78	77.27	148.61	48.37	79.38
2015-16	5.28	0.49	1.99	50.88	148.73	81.38	51.37	154.01	83.36
2016-17	5.10	0.44	1.90	166.71	56.47	91.08	171.81	56.91	92.98

Source: Various issues of TRAI Quarterly Reports.

Table 14: Service Area Wise MNP Status

Zone- I		Zone II	
Service Area	No of Porting Requests	Service Area	No of Porting Requests
Delhi	15528180	Andhra Pradesh	29212083
Gujarat	23332697	Assam	1936485
Haryana	12973715	Bihar	12034024

Zone- I		Zone II	
Service Area	**No of Porting Requests**	**Service Area**	**No of Porting Requests**
Himachal Pradesh	1530172	Karnataka	34358105
Jammu & Kashmir	320602	Kerala	8602026
Maharashtra	23198202	Kolkata	7431511
Mumbai	18206137	Madhya Pradesh	23411971
Punjab	12809443	North East	656434
Rajasthan	27543325	Orissa	6528591
Utter Pradesh(East)	17403372	Tamil Nadu	20746002
Utter Pradesh(West)	14974624	West Bengal	18243222
Total	**167820469**	**Total**	**163160454**
Total (Zone-I + Zone-II)			**330980923**
Net Addition in November, 2017			15987216

Source: TRAI Reports
