ABSTRACT

Society today has made itself so used to telecommunication that the world would collapse if it was taken away. The reason for the tremendous growth of telecommunications is because we needed a better way to relay messages to each other.

Globalisation has made telecommunication an integral part of the infrastructure of the Indian economy. India's telecommunication network is the second largest in the world based on the total number of telephone users (both fixed and mobile phone). It has one of the lowest call tariffs in the world enabled by the mega telephone networks and hyper-competition among them. It has the world's third-largest Internet user-base. 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. Major sectors of the Indian telecommunication industry are telephony, internet and television broadcasting.

In this research paper, main emphasis has been placed to bring to light the history and development of telecommunication sector in India. It also uncovers the importance of telecom sector in India and the various factors that have played a major role in facilitating the growth of telecom sector in India. Data has been collected from multiple sources including books, journals, websites, newspapers etc. The paper describes the current scenario of Indian telecom sector.

**Keywords:** National Telecom Policy 2012; Telecommunication Sector; Telecom Circles

INTRODUCTION

Communication is a hugely important aspect, not only for people around the world, but also for small and large businesses. Long distance communication has been around for years with the oldest methods that can be remembered to date being the use of smoke signals. With time, methods such as horns became a means of communication. But with time there has been a lot of development and with that came the more advanced technologies such as radio, phone, television and the Internet. Businesses would be lost without the current technological advancements and a lot of companies would cease to exist. But this is not the only benefit that telecommunications can bring. With these advancements also comes science. Without telecommunications, we would be unable to fly on planes and helicopters or effectively navigate in the seas. Besides this, space travel would be nearly impossible.

A world without telecommunications would not be possible; society has made itself so used to this type of technology that the world would end up collapsing if it was taken away. The reason for the tremendous growth of telecommunications is because, as people and cities throughout the planet grew, we needed a better way to relay messages between one another.

The greatest technological advancement that we could have possibly got from this is the creation of phone and the Internet. The phone was a major piece of communication, whereby you could instantly communicate with another person that was on the other side of the world. Almost every household now has at least one phone, with most having several.
But the development of the Internet was the major turning point and it sees the potential future expanding further than we could have ever imagined. With VoIP growing at tremendous speeds, calls are getting cheaper, and with portable ways to connect to the Internet it looks as though most of the modes of communication will use the Internet as a connection unit.

The vast impact that telecommunication has had on the world can be seen anywhere and everywhere, wherever you go or whatever you do. If you are driving your car, immediately there are two instances, which include your radio and your satellite navigation. Telecommunications is a must and it provides better awareness of the society we are living in. It makes us communicate with every corner of the earth to solve problems and make the world a much safer place.

The last decade is characterised by significant penetration of telecommunications in India. The number of telephone connections has increased to 893 million in January 2013 as compared to 41 million in December 2001. This growth has been primarily fuelled by the cellular segment (mobile phones) which alone accounted for 862 million connections at the end of January 2013. The composition of the telecom sector too has witnessed a structural change, with the private sector accounting for around 88% of the total connections. While urban teledensity has risen to 148%, rural teledensity has also increased significantly to 40%.

The socio-economic impact that this growth has had on the country, points to both the opportunities and challenges confronting the sector in the years to come. Recognising these new opportunities and the imperatives arising from the challenges in terms of consumer needs, technology and structure of the industry, Government has adopted the National Telecom Policy 2012, to drive the next revolution in growth of telecom services and provide a stable policy regime for the years to come.

The policy has set ambitious targets of 100% rural teledensity and 600 million broadband connections by 2020. NTP-2012 outlines various measures envisaged to develop a conducive ecosystem to achieve these lofty aspirations. To spur this phase of growth of the sector, Government has already launched a national optical fibre network project called NOFN. NOFN will connect over 250,000 gram panchayats through high speed, high capacity optical fibre medium. This network in conjunction with private sector participation at the last mile would result in provision of a range of innovative services to rural India. At the same time, this would enable people in rural areas to participate in, contribute to and derive benefits from the information economy. 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. It also has helped to increase the transparency of governance with the introduction of e-governance in India. The government has pragmatically used modern telecommunication facilities to deliver mass education programmes for the rural folk of India.

OBJECTIVE AND METHODOLOGY

This paper throws light on the evolution of telecom sector in India. It is descriptive in nature where the focus is on providing and understanding the growth, importance, facilitating factors and challenges of telecom sector. For this purpose, secondary data has been collected through books, journals, websites, govt. reports etc.

Industry Profile

India’s telecommunication network is the second largest in the world based on the total number of telephone users (both fixed and mobile phone). It has one of the lowest call tariffs in the world enabled by the mega telephone networks and hyper-competition among them. It has the world’s third-largest Internet user-base. 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. Major sectors of the Indian telecommunication industry are telephony, internet and television broadcasting.

Indian telecom sector is more than 165 years old. Telecommunications was first introduced in India in 1851 when the first operational landlines were laid by the government near Kolkata (then Calcutta), although telephone services were formally introduced in India much later in 1881. Further, in 1883,
telephone services were merged with the postal system. In 1947, after India attained independence, all foreign telecommunication companies were nationalized to form the Posts, Telephone and Telegraph (PTT), a body that was governed by the Ministry of Communication.

Liberalisation of Indian telecommunication industry started in 1981 when Prime Minister Indira Gandhi signed contracts with Alcatel CIT of France to merge with the state owned Telecom Company (ITI), in an effort to set up 5,000,000 lines per year. But soon the policy was let down because of political opposition. Attempts to liberalise the telecommunication industry were continued by the following government under the prime-ministership of Rajiv Gandhi. He invited Sam Pitroda, a US-based Non-resident Indian NRI and a former Rockwell International executive to set up a Centre for Development of Telemetric (C-DOT) which manufactured electronic telephone exchanges in India for the first time. Sam Pitroda had a significant role as a consultant and adviser in the development of telecommunication in India.

In 1985, the Department of Telecom (DoT) was separated from Indian Post & Telecommunication Department. DoT was responsible for telecom services in entire country until 1986 when Mahanagar Telephone Nigam Limited (MTNL) and Videsh Sanchar Nigam Limited (VSNL) were carved out of DoT to run the telecom services of metro cities (Delhi and Mumbai) and international long distance operations respectively.

The demand for telephones was ever increasing and in the 1990s Indian government was under increasing pressure to open up the telecom sector for private investment as a part of Liberalisation-Privatisation- Globalisation policies that the government had to accept to overcome the severe fiscal crisis and resultant balance of payments issue in 1991. Consequently, private investment in the sector of Value Added Services (VAS) was allowed and cellular telecom sector were opened up for competition from private investments. It was during this period that the Narsimha Rao-led government introduced the National Telecommunications policy (NTP) in 1994 which brought changes in the following areas:

- Ownership,
- Service and
- Regulation of telecommunications infrastructure

The policy introduced the concept of telecommunication for all and its vision was to expand the telecommunication facilities to all the villages in India. Liberalisation in the basic telecom sector was also envisaged in this policy. They were also successful in establishing joint ventures between state owned telecom companies and international players. Foreign firms were eligible to 49% of the total stake. The multi-nationals were just involved in technology transfer, and not policy making.

During this period, the World Bank and ITU had advised the Indian Government to liberalise long distance services to release the monopoly of the state owned DoT and VSNL and to enable competition in the long distance carrier business which would help reduce tariff's and better the economy of the country. The Rao run government instead liberalised the local services, taking the opposite political parties into confidence and assuring foreign involvement in the long distance business after 5 years. The country was divided into 20 telecommunication circles for basic telephony and 18 circles for mobile services. These circles were divided into category A, B and C depending on the value of the revenue in each circle. The government threw open the bids to one private company per circle along with government owned DoT per circle.

For cellular service two service providers were allowed per circle and a 15 years licence was given to each provider. During all these improvements, the government did face oppositions from ITI, DoT, MTNL, VSNL and other labour unions, but they managed to keep away from all the hurdles.

In 1997, the government set up TRAI (Telecom Regulatory Authority of India) which reduced the interference of Government in deciding tariffs and policy making. The political powers changed in
1999 and the new government under the leadership of Atal Bihari Vajpayee was more pro-reforms and introduced better liberalisation policies. In 2000, the Vajpayee government constituted the Telecom Disputes Settlement and Appellate Tribunal (TDSAT) through an amendment of the TRAI Act, 1997. The primary objective of TDSAT’s establishment was to release TRAI from adjudicatory and dispute settlement functions in order to strengthen the regulatory framework. Any dispute involving parties like licensor, licensee, service provider and consumers are resolved by TDSAT. Moreover, any direction, order or decision of TRAI can be challenged by appealing in TDSAT. The government corporatized the operations wing of DoT on 1 October 2000 and named it as Department of Telecommunication Services (DTS) which was later named as Bharat Sanchar Nigam Limited (BSNL). The proposal of raising the stake of foreign investors from 49% to 74% was rejected by the opposite political parties and leftist thinkers. Domestic business groups wanted the government to privatise VSNL. Finally in April 2002, the government decided to cut its stake of 53% to 26% in VSNL and to throw it open for sale to private enterprises. TATA finally took 25% stake in VSNL. This was a gateway to many foreign investors to get entry into the Indian Telecom Markets. After March 2000, the government became more liberal in making policies and issuing licenses to private operators. The government further reduced licence fees for cellular service providers and increased the allowable stake to 74% for foreign companies. Because of all these factors, the service fees finally reduced and the call costs were cut greatly enabling every common middle-class family in India to afford a cell phone. Nearly 32 million handsets were sold in India at that time. The data reveals the real potential for growth of the Indian mobile market. Many private operators, such as Reliance Communications, Tata Indicom, Vodafone, Loop Mobile, Airtel, Idea etc., successfully entered the high potential Indian telecom market.

The breath-taking growth of the telecommunication companies in India over the last twenty years has made a history. The economic resurgence affected in the early 1990s brought around a paradigm shift on the overall business scenario of India. With the arrival of private telecommunication companies in India, the industry observed introduction of mobile phones into the Indian market and it became extremely popular amongst the Indian masses.

Removal of restrictions on foreign capital investment and industrial de licensing has allowed various private players to enter into the Indian telecommunication market.

The Indian telecom industry is characterised with intense competition, and continuous price wars. Currently, there are around a dozen telecom service providers who operate in the wired and wireless segment. The Industry has grown over twenty times in just ten years, from under 37 million subscribers in the year 2001 to over 898 million subscribers in the year 2013.

Factors Facilitating Growth of the Telecom Sector in India

The phenomenal growth in the Indian telecom industry was brought about by the wireless revolution that began in the nineties. Besides this, the following factors also aided the growth of the industry.

Liberalisation

The relaxation of telecom regulations has played a major role in the development of the Indian telecom industry. The liberalisation policies of 1991 and the consequent influx of private players have led the industry on a high growth trajectory and have increased the level of competition. Post-liberalisation, the telecom industry has received more investments and has implemented higher technology.

Increasing Affordability of Handsets

The phenomenal growth in the Indian telecom industry was predominantly aided by the meteoric rise in wireless subscribers, which encouraged mobile handset manufacturers to enter the market and to cater to the growing demand. Further, the manufacturers introduced lower-priced handsets with add-on facilities to cater to the increasing number of subscribers from different strata of the society. Now even
entry-level handsets come with features like coloured display and FM radio. Thus, the falling handset prices and the add-on features have triggered growth of the Indian telecom industry.

Prepaid Cards Bring in More Subscribers

In the late nineties, India was introduced to prepaid cards, which was yet another milestone for the wireless sector. Prepaid cards lured more subscribers into the industry besides lowering the credit risk of service providers due to its upfront payment concept. Prepaid cards were quite a phenomenon among first-time users who wanted to control their bills and students who had limited resources but greater need to be connected. Pre-paid cards greatly helped the cellular market to grow rapidly and cater to the untapped market. Further, the introduction of innovative schemes like recharge coupons of smaller denominations and life time incoming free cards has led to an exponential growth in the subscriber base.

Introduction of Calling Party Pays (CPP)

The CPP regime was introduced in India in 2003 and under this regime, the calling party who initiated the call was to bear the entire cost of the call. This regime came to be applicable for mobile to mobile calls as well as fixed line to mobile calls. So far India had followed the Receiving Party Pays (RPP) system where the subscriber used to pay for incoming calls from both mobile as well as fixedline networks. Shifting to the CPP system has greatly fuelled the subscriber growth in the sector.

Changing Demographic Profile

The changing demographic profile of India has also played an important role in subscriber growth. The changed profile is characterised by a large young population, a burgeoning middle class with growing disposable income, urbanisation, increasing literacy levels and higher adaptability to technology. These new features have multiplied the need to be connected always and to own a wireless phone and therefore, in present times mobiles are perceived as a utility rather than a luxury.

Increased Competition & Declining Tariffs

Liberalisation of the telecom industry has fuelled intense competition, especially in the cellular segment. The ever-increasing competition has led to high growth of subscribers and has put pressure on tariffs, which have seen a sharp drop over the years. When the cellular phones were introduced, call rates were at a peak of Rs 16 per minute and there were charges for incoming calls too. Today, however, incoming calls are no longer charged and outgoing calls are charged at less than a rupee per minute. Thus, the tariff war has come a long way indeed. Increased competition and the subsequent tariff war has acted as a major catalyst for attracting more subscribers. Apart from these major growth drivers, an improved network coverage, entry of CDMA players, growth of value-added services (VAS), advancement in technology, and growing data services have also driven the growth of the industry.

Challenges

Even though the Indian telecommunications sector has come a long way since the time of liberalization and promises growth, there are a number of issues which still pose a challenge to its progress. Two critical issues are:

- High capital investments
- Well-established players who have a nationwide network
- License fee
- Continuously evolving technology
- Decling Average Revenue Per User
- Lack of Telecom Infrastructure
A wide variety of choices available to customers both in fixed as well as mobile telephony has resulted in increased bargaining power for the customers.

**Indian Telecom Circles**

A telecom circle is a cellular mobile service area in India classified by subscriber base and revenue potential. The four types of telecom circles are Metro, A, B and C. While a Metro telecom circle has the highest revenue potential, a C telecom circle has the lowest. At present, there are 23 Telecom Circles or Service Areas.

The 'metro' circles cover very dense population centers in the very largest Indian cities: Delhi, Kolkata, Chennai and Mumbai.

The ‘A’, ‘B’, and ‘C’ circles cover various geographic territories of varying population sizes. ‘A’ circles are the largest in terms of population coverage. ‘C’ circles contain the smallest population.

The borders of the circles roughly correspond to the borders of the Indian states -- but there are exceptions. For instance, some smaller states are folded into larger neighboring states, some other smaller states are combined together to form one circle, etc.

**Key Statistics**

**Table 1.** Highlights on Telecom Subscription Data as on 31st March, 2014 (Source: TRAI)

<table>
<thead>
<tr>
<th>Particulars</th>
<th>Wireless</th>
<th>Wireline</th>
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<tr>
<td>Total Subscribers (Million)</td>
<td>904.51</td>
<td>28.49</td>
<td>933.00</td>
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<tr>
<td>Total Net Monthly Addition (Million)</td>
<td>1.15</td>
<td>-0.11</td>
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<td>Monthly Growth</td>
<td>0.13%</td>
<td>-0.37%</td>
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<tr>
<td>Urban Subscribers(Million)</td>
<td>532.73</td>
<td>22.53</td>
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<td>Urban subs. Net Monthly Addition(Million)</td>
<td>-1.67</td>
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<td>Monthly Growth</td>
<td>-0.31%</td>
<td>-0.25%</td>
<td>-0.31%</td>
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<tr>
<td>Rural Subscribers(Million)</td>
<td>371.78</td>
<td>5.96</td>
<td>377.73</td>
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<tr>
<td>Rural subs. Net Monthly Addition(Million)</td>
<td>2.82</td>
<td>-0.05</td>
<td>2.77</td>
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<tr>
<td>Monthly Growth</td>
<td>0.76%</td>
<td>-0.85%</td>
<td>0.74%</td>
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<tr>
<td>Overall Teledensity</td>
<td>72.94</td>
<td>2.30</td>
<td>75.23</td>
</tr>
<tr>
<td>Urban Teledensity</td>
<td>139.86</td>
<td>5.91</td>
<td>145.78</td>
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<tr>
<td>Rural Teledensity</td>
<td>43.27</td>
<td>0.69</td>
<td>43.96</td>
</tr>
<tr>
<td>Share of Urban Subscribers</td>
<td>58.90%</td>
<td>79.09%</td>
<td>59.51%</td>
</tr>
<tr>
<td>Share of Rural Subscribers</td>
<td>41.10%</td>
<td>20.91%</td>
<td>40.49%</td>
</tr>
</tbody>
</table>

Source: TRAI

**Chart 1.** Showing Total Subscribers and overall Teledensity in India as on 31st March 2014
Chart 2. Service Provider wise Market Share as on 31st March, 2014

Chart 3. Service Provider wise net subscriber addition during March, 2014

Table 2. Summary of Wireless Subscriber base of various circles as on March 2014

<table>
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<tr>
<td>Airtel</td>
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</tbody>
</table>
Table 2. Summary of Wireless Subscriber base of various circles as on March 2014

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</thead>
<tbody>
<tr>
<td>Sistema</td>
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<td>240050</td>
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<tr>
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<td>Quadrant</td>
<td>2170557</td>
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<td>54.85</td>
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</table>

Source: TRAI

CONCLUSION

Telecommunication has emerged as a key driver of economic and social development in an increasingly knowledge intensive global scenario. The cellular segment is playing an important role in the industry by making itself available in the rural and semi urban areas where teledensity is the lowest. Sustained adoption of technology offers viable options in overcoming developmental challenges in education, health, employment generation, financial inclusion and much else. Today, India is one of the fastest growing telecom markets in the world.

India’s teledensity has improved from under 4% in March 2001 to around 75.23% by the end of March 2014. Cellular telephony continues to be the fastest growing segment in the Indian telecom industry. The mobile subscriber base (GSM and CDMA combined) has grown from under 2 m at the end of FY00 to touch almost 932 m at the end of March 2014. Tariff reduction and decline in handset costs has helped the segment to gain in scale. The cellular segment is playing an important role in the industry by making itself available in the rural and semi urban areas where teledensity is the lowest.

The unprecedented increase in teledensity and sharp decline in tariffs in the Indian telecom sector have contributed significantly to the country’s economic growth. Besides contributing to about 3% to India’s GDP, Telecommunications, along with Information Technology, has greatly accelerated the growth of the economic and social sectors and will continue to do so in future.

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