

SEPTEMBER 2016 • Vol. 2 • Issue 6

MONTHLY • Pages 32

₹ 200

RNI No.: DELENG/2015/67140; Published on: Every month; Posted at Nehru Place Sorting Office, New Delhi on every 1st week of the month

THE AWARE CONSUMER

(SUBSCRIBER COPY NOT FOR RESALE)

www.consumerconexion.org

THE LAST MILE
The Internet of
Things

OUT OF THE BOX
Standards of
the G's

IN FOCUS
Telecom Services

Indian Telecom Industry Need to Speed



PLUS

ROUND UP • MY MARKET • THE PRESCRIPTION

OUR
BUSINESS
is PATIENT
SAFETY.

Partnership for
SAFE MEDICINES INDIA
 SAFEMEDICINESINDIA.in



BEJON KUMAR MISRA | bejonmisra@consumerconexion.org

India to develop own routers to not leak TELECOMMUNICATION

TELECOMMUNICATION has been renowned worldwide as a significant tool for socioeconomic development for a nation and plays a remarkable role in the growth and modernization of various sectors of the economy. Over the last few years, the Indian telecom sector has revealed the irresistible growth, thanks to domestic demand, policy initiatives undertaken by the government and admirable efforts of the service providers in the industry and in the process, has managed to emerge as one of the youngest and fastest growing economies in the world today.

The Government of India's liberal and reformist policies have been influential along with huge consumer demand in the rapid growth in the Indian telecom sector. The government has permitted easy market access to telecom service provider and an independent regulatory framework that has ensured accessibility of telecom services to every consumer at the affordable prices. The deregulation of Foreign Direct Investment (FDI) policies have made the sector one of the fastest growing and one of the top employment opportunity generator in the country.

The urban telecom-density is over 150%, while rural telecom density is

merely 40%, and we need to fix this gap. As the majority of the population resides in rural areas, it is required that the government takes steps to improve rural telecom density. No doubt the government has taken certain policy initiatives, which include the creation of the Universal Service Obligation Fund and Digital India, for improving rural telecommunications sector. These measures are expected to improve the rural telecom density and bridge the rural-urban gap in telecom density.

The future of telecommunication is certainly an interesting area as the operators are mastering the technological advancements and with administrative, regulatory reforms while illustrating transparency, customer innovation and conveying new services to the market. These strategies include investment in next-generation technologies and alternative network sourcing arrangements. With continued pressure from new players entering the market, operators must continually find ways to stay ahead of the game.

The deregulation of Foreign Direct Investment (FDI) policies have made the sector one of the fastest growing and one of the top employment opportunity generator in the country.

**“Let's
Not Fall
Victims
to Fraud
Be Aware”**

JAGOGRAHAKJAGO.COM



In India, telecommunication has played a significant role to narrow down the rural-urban digital divide to some point. It also has helped to increase the transparency of governance with the introduction of e-governance. The government has sensibly used modern telecommunication facilities to deliver several health and education plans for the rural folk of India.



RESEARCH FEATURE

12 | An overview of Indian Telecom Industry

28.3 million smartphones were shipped to India in 3Q 2015 with 21.4% Year over Year (YoY) growth. With such exponential growth, India could overtake the US as the 2nd largest smartphone market by 2017.

HORIZONS

15 | TELECOM: THE PERFECT STORM



Increasing competition among telecom operators allowed the prices drastically down by making the mobile facility accessible to the urban class population, and to a great extent in the rural areas.

IN FOCUS

17 | TELECOM SERVICES



- Internet
- Voice
- Data
- Cloud Computing

AFTERWORD

20 | The Future of Indian Telecom Industry



The Indian telecom industry is expected to become bigger and better. PwC predicts several key trends; all that point towards an increasing competition in the telecom industry.

MY MARKET



21 | Telecom companies in India

In 1975, the Department of Telecom (DoT) was given separate authority for regulating the telephone services in the country.

THE LAST MILE

23 | The Internet of Things in Telecom



The Internet of things offers the telecom service provider a wide variety of possibilities to explore.

THE PRESCRIPTION

24 | Call drops: Telecom operators promise action



Telecom industry assured the DoT that it will accelerate and redeploy their plan, meaning with that of Rs 52,000 crore of capital expenditure it would spend Rs 12,000 crore over the course of the next three months in putting up 60,000 towers of the 100,000 it plans to put during the year.

OUT OF THE BOX

27 | Standards of the G's



Each of the Generations has standards that must be met to legally use the G terminology. Those standards are set by ITU Radiocommunication Sector (ITU-R).

THE AWARE CONSUMER

UNLOCKING CONSUMER POTENTIAL
www.consumerconexion.org

SEPTEMBER 2016 • Vol. 2 • Issue 6

Bejon Kumar Misra
EDITOR & PUBLISHER
Address: F - 9, Second Floor, Kailash Colony,
New Delhi - 110048
E-mail: bejonmisra@consumerconexion.org

EDITORIAL CONSULTANTS

S. Krishnan
Suman Misra
Pawendra
Pyush Misra

DESIGN

SR. CREATIVE DIRECTOR: Pooja Khaitan
DESIGNER: Galaxy
WEB DESIGNER: Manish Mohan

The AWARE CONSUMER

is printed and published by
Bejon Kumar Misra
at F - 9, Second Floor, Kailash Colony,
New Delhi - 110048 and printed at
M/s. Spectrum Printing Press (P) Ltd.,
Shed No. 23, Computer Complex,
DSIDC Scheme I, Okhla Phase II,
New Delhi - 110020

Place of Publication: E - 45, Ground Floor,
Greater Kailash Enclave - I, New Delhi-110048

For any queries, please contact us at
pooja@consumerconexion.org
Phone: 011-26271421/22/23

Total number of pages - 32, Including Covers

Material in this publication may not be
reproduced in any form without the written
permission of the Editor & Publisher.

DISCLAIMER: The views expressed in this
magazine are solely those of the author in his/her
private capacity and do not in any way represent
the views of the Editor & Publisher.



Please Recycle
This Magazine
And Remove
Inserts Before
Recycling

Telecommunications – bridge the gaps between technology, business and law through understanding of the viewpoints of each profession.

ROUNDUP



Telecommunications

In India, it has played a significant role to narrow down the rural-urban digital divide to some point. It also has helped to increase the transparency of governance with the introduction of e-governance in India.

'TELECOMMUNICATION' IS A term coming from the Greek and it means 'communication at a distance'. Telecommunication is the transmission of any signals, images, videos and sounds or intelligence of any nature over cable, radio, optical fiber or other electromagnetic systems as defined by the International Telecommunication Union (ITU). Think about phone calls, text messaging, emails, viewing pages on the Internet, downloading and uploading files. All of these communications make use of a telecommunications system. Telecommunication system is basically a collection of nodes and links to enable communication from transmitter to receiver which uses electrical signals or electromagnetic waves as its medium to convey the information.

Telecommunications, also called telecommunication, is the interchange of information over significant distances by electronic means. A complete, single telecommunication system consists of two stations, each equipped with a transmitter for transmitting the information and a receiver for

receiving the information. The transmitter and receiver at any station may be combined into a single device called a transceiver. The medium of signal transmission can be copper wire or cable, optical fiber or electromagnetic waves. The free-space transmission and reception of any information or data by means of electromagnetic waves is called wireless communication.

The Internet is the largest example, while on a smaller scale, it is Telephony. A broadcast network is also a form of telecommunication, consisting of a single transmitting station and multiple receive-only stations. Radio and TV broadcasting are the most common examples.

In telecommunications, information or data is conveyed by means of an electrical signal called the carrier or carrier wave. In order for a carrier to convey information, some form of modulation is required. The mode of modulation can be broadly categorized as either analog or digital. In analog modulation, some characteristic of the carrier is varied in a continuous way. Analog modulation;

DATA BRIEFING

The urban telecom-density is over **150%** while rural telecom density is merely 40%, and we need to fix this gap.

Access & connectivity

SOCIETY TODAY HAS made itself so used to telecommunication that the world would break down if it was taken away. The reason for the incredible growth of telecommunications is because we wanted a better way to express communications to each other. Every one, every home, every business wants a fast and consistent network services. This would help us all be better connected, while enhancing our productivity and performance.

The network connectivity or the internet does not stop at the border. We want to sense the comfort of being online and communicating one-another. We need a free and open network connectivity and internet; and service providers should maximize their wireless capacity across the country. We should benefit from better access, connectivity, deals and services, anywhere and anytime in the country.

Digital services, from video streaming to cloud computing to e-Health, rely on fast, effective network connections. We want a sound framework for telecommunications, supporting wireless technologies, without high roaming charges, and consumer rights. Internet users can access the content, applications and services of, their choice smoothly; it promotes competition among network service providers.

The network connectivity is one of the most essential mechanisms of telecommunication. As we all know that the field of telecommunication is changing every day. Mergers, acquisitions and partnerships are being formed; all of which impact the customer. In addition, the technology being offered is becoming more innovative with newer, faster, more efficient means of telecommunication, especially in the areas of voice, data and Internet services. Therefore, the service providers are striving to become your total solution provider by offering a complete line of products and services. ■



Telecom

THE TELECOMMUNICATION INDUSTRY has experienced strong growth and change during the last five years. Deregulation driven by the Telecommunications Act of 1996 pooled with frequent developments in technology and massive market force convergence of telecommunications services and merging of several service providers is the key evolution of the Indian telecom industry.

The mantra of today's telecommunications market and consumers is for more, faster, better, and cheaper. While the telecommunications market remains driven by technological developments, consumer demand, massive infrastructure investments, and mega-mergers, it is further complex and sometimes mired by the regulation, deregulation, litigation, and confusion. Deregulation shall continue to progress in fits and starts, but not without major legal issues and challenges. All the time, the telecommunication industry remains a significant and a fast growing segment of the Indian economy.

Today, telecommunications consist of using microelectronic i.e. small semiconductor chip, integrated circuits, computer, and other technologies to transmit and receive voice, data, and video communications over different transmission media, including copper wire, optical

Continued from page 7

Amplitude Modulation (AM) is the oldest form of modulation and is still used in radio broadcasting at some frequencies. Digital modulation actually precedes analog modulation; the earliest form was Morse code. During the 1900s, numerous different forms of modulation were developed and used, particularly during the period of digital revolution when the use of computers among ordinary citizens became popular.

Today, telecommunication systems use different types of communication networks. These include both wired and wireless connections. Wired connections consist of physical cable, such as copper wire or fiber optics. Wireless connections do not use any such physical cable, but transfer data using waves at a particular part of the electromagnetic spectrum.

Telecommunication also upheld the socioeconomic development of the

Technology Evolution

fiber, and electromagnetic transmissions. We are doing more than just voice communications. Various techniques of analog and digital transmission are employed in telecommunications today. Analog communication is like a dimmer switch for light because it has an almost unlimited number of brightness settings, whereas digital communication works like a simple light switch that has only on or off.

Earlier, when people use the word 'telecommunication', most think of the classical analog telephone. That is telephony. The telephone network was initially designed to carry human voice and not digital information such as data, music, or video. It supported telephony, i.e. voice

communications, but not telecommunications such as data, image, and video and is basically focused on voice communications.

Nowadays, telecommunications have evolved into much more.

The evolution of 3G, 4G, WAN, LAN, wireless communications, Wi-MAX and several other technologies merge to become telecommunications in the millennium. As a result of

the tremendous growth in telecommunications demands during recent decades, much attention

has been given to research in the field of telecommunication and this has made the telecommunication standard bodies to develop new technologies that are able to convey voice, data and video

seamlessly.

Today, International Telecommunication Union (ITU) is also dedicating much effort to bridging the digital divide and passing the benefits of Information and Communication Technology (ICT) to all. The ITU is mandated by its Constitution to ease universal access so that people everywhere can participate in, and benefit from, the emerging information society and global economy.

The evolution of 3G, 4G, WAN, LAN, wireless communications, Wi-MAX and several other technologies merge to become telecommunications in the millennium.

nation. In India, it has played a significant role to narrow down the rural-urban digital divide to some point. It also has helped to increase the transparency of governance with the introduction of e-governance in India. The government has sensibly used modern telecommunication facilities to deliver several health and education plans for the rural folk of India.

Telecommunication and broadcasting worldwide are overseen by the International Telecommunication Union (ITU), an agency of the United Nations (UN) with its headquarters in Geneva, Switzerland. Most countries have their own agencies that enforce telecommunications regulations framed by their governments. In India, that agency is the Telecom Regulatory Authority of India (TRAI) and the Department of Telecommunication of India (DoT). ▶

Telecommunications in India have significantly been supported by the INSAT system of the country, one of the largest domestic satellite systems around the world. India possesses a diversified and extended communications system, which connects all parts of the country and the world together by telephone, internet, radio, television and satellite. ▶

The role of Government in regulating Telecommunication

TELECOMMUNICATION SERVICES have been accepted the world-over as a key tool for the socioeconomic development of a nation and hence telecom infrastructure is treated as a fundamental factor to attain the socioeconomic objectives in India. As a result, the Department of Telecommunications (DoT) has been formulating progressive plans for the better growth of the telecommunication services. The Department is responsible for the grant of licenses for various telecom services. The Department is also responsible for spectrum distribution in the field of radio communication in close coordination with the international bodies. It also governs wireless regulatory measures by inspecting wireless transmission of all operators inside the country.

The Department of Telecommunications, is part of the Ministry of Communications and Information Technology of the executive branch of the Government of India.

The following units function under the DoT:

- Telecom Enforcement Resource and Monitoring (TERM) Cells, formerly Vigilance Telecom Monitoring (VTM)
- Controller Of Communication Accounts (CCA) Units (Details of CCA Offices)
- Wireless Planning & Coordination Wing (WPC)
- Telecommunication Engineering Center (TEC)

- National Telecommunications Institute for Policy Research Innovation Training (NTIPRIT)
- National Institute of Communication Finance (NICF)
- Telephone Advisory Committees

In 1997, the government sets up Telecom Regulatory Authority of India (TRAI) which eased the interference of the government in deciding tariffs and policy making. Further, the government has introduced more pro-reforms and better liberalization policies. In 2000, the government constituted the Telecom Disputes Settlement and Appellate Tribunal (TDSAT) through an amendment of the TRAI Act, 1997. The main objective of the establishment of TDSAT was to release TRAI from adjudicatory and dispute settlement functions in order to strengthen the regulatory framework. Any dispute among parties like licensor, licensee, service provider and consumers are resolved by TDSAT.

To check the call drop menace and improve compliance to its rules, TRAI has approached the Department of Telecom (DoT) to mend the TRAI Act to empower it to impose a fine of Rs.10 crore on operators as well jail term of up to two years to company executives for any violation of regulatory framework.

TRAI had put in place a new set of rules mandating telecom operators to pay Re 1 for each dropped call, subject to a maximum Rs. 3 per day, but the order was quashed by the Supreme Court after companies appealed against it. ▶



Indian Telecom Industry



Need To Speed

28.3 million smartphones were shipped to India in 3Q 2015 with 21.4% Year over Year (YoY) growth. With such exponential growth, India could overtake the US as the 2nd largest smartphone market by 2017.

OVER 1.03 BILLION Indians are nailed onto mobile phones, wherein more than 21.2% of them accounted for smartphone users a recent survey reveals. The growth is predictable to hit 30% by 2017. While, the number of internet users in India touched 354 million by the end of June 2015, this means that more than half the population is yet to receive an internet subscription. Additionally, reports suggest that about 60% of these subscriptions are mobile internet users.

The Indian telecom industry is said to be the second largest in the world, recording an impressive growth in the past decade. The market is driven by a strong adoption of data consumption, especially on smartphones; and according to International Data Corporation (IDC), 28.3 million smartphones were shipped to India in 3Q 2015 with 21.4% Year over Year (YoY) growth. With such exponential growth, India could overtake the US as the 2nd largest smartphone market by 2017.

India might need to focus on upgrading its internet infrastructure requirement, especially in the wireless segment. The wireless segment dominated the Indian Telecom market with a whopping 97.3% of total subscription as per the India Brand Equity Foundation (IBEF). Similarly, the country saw a spike in the number of broadband subscriptions data from TRAI reveals that India recorded a 52.49% YoY growth, totaling to 108.85 million users by the end of Q2 2015 in June '15.

Above all factors approving that the Indian telecom sector stands at the epicenter for growth and innovations. Smart devices and internet connectivity continue to be more and more embedded in the fabric of society today and they are key in driving the momentum around some key trends such as video streaming, Internet of Things (IoT), and e-commerce. Today, when the world's average internet speed stands at 5 Mbps, India ranks fourth-last, according to Akamai 2015 rankings, with just 14% of the connections over 4 Mbps, it is needed to speed up our telecom services.

In brief, India needs to focus on the new shift in networking technologies, including high-speed mobile networks, wire-line and wireless broadband to allow a value flow, and to bring in more subscriptions under its base. ▶

An overview of Indian Telecom Industry

Indian telecom industry is more than 165 years old. Telecommunications was first introduced in 1851, when the first functioning land lines were laid by the government near Kolkata (Calcutta), however telephone services were officially introduced in India much later in 1881. After India achieved independence in 1947, all telecommunication companies were nationalized to form the Posts, Telephone and Telegraph (PTT), a body that was administered by the Ministry of Communication. The actual evolution of the telecom industry started after the Government alienated the Department of Post and Telegraph in 1985 by setting up the Department of Posts and the Department of Telecommunications (DoT).

The entire evolution of the telecom industry can be classified into three distinct phases.

Phase I- Pre-Liberalization Era (1980-89)

- Entry of private sector in telecommunications equipment manufacturing-1984
- Formation of Mahanagar Telephone Nigam Limited (MTNL) and Videsh Sanchar Nigam Limited (VSNL)-1986
- Telecom commission was set up in 1989

Phase II- Post Liberalization Era (1990-99)

- Liberalization of Indian Economy-1990s
- Private sector participation in provision of VAS such as cellular and paging services-1992
- National Telecom Policy announced- 1994
- Telephone Regulatory Authority of India (TRAI) established in 1997
- New telecom Policy was announced in 1999

Phase III- Post 2000

- Bharat Sanchar Nigam Limited (BSNL) established in 2000
- National Long Distance (NLD) and International Long Distance (ILD) services opened to competition in 2000
- CDMA technology was launched in 2000
- Internet telephony was initiated in 2000
- VSNL privatized in 2002
- BSNL launched its mobile services in 2002
- Unified Access Licensing (UASL) regime was introduced in 2003
- Calling Party Pays (CPP) was implemented in 2003
- Broadband Policy was formulated in 2004
- Intra circle merger guidelines were established in 2004
- FDI limits increased from 49% to 74% in 2005
- National Telecom Policy 2012 approved by the government, is a replacement of NTP 1999
- Number Portability was approved in 2011
- FDI limits increased from 74% to 100% in order to encourage foreign investors to invest in the Indian Telecom industry in 2013.



The telecom industry in India has experienced exponential growth over the past few years and has been an important contributor to economic growth; however, the cut-throat competition and intense tariff wars have had some negative impact on the revenue of operators. Despite the challenges, the Indian telecom industry will flourish because of the immense potential in terms of new subscribers. India is one of the most-attractive telecom markets because it is still one of the lowest penetrated markets. The government is keen on developing rural telecom infrastructure and is also set to roll out next generation or 4G services in the country. Operators are in an expansion mode and are investing heavily in telecom infrastructure and foreign telecom companies are acquiring considerable stakes in Indian companies. ■

An Analysis of the Indian Telecom Industry

THE TELECOMMUNICATIONS Industry in India is one of the vast and leading industries in the world, linking different parts of the country together through various modes like telephone, radio, television, internet, etc. The Telecom Regulatory Authority of India (TRAI) governs this industry by providing a regulatory framework and favorable environment for its efficient operation. The Indian telecom industry stands as the second- largest in the world due to its rapid progression and is in cutthroat competition with the telecom industries of other developed nations. The telecommunication services offered by the industry are easily accessible at affordable prices to the users of urban and rural areas of the country. Though, India's telecom network encompasses a highly developed and unique technology in the world still Indian telecom industry, emphasizing upon its major segments such as government telecom policies followed by its growth and development in the present scenario along with the future opportunities for advancement.

The Indian Telecom Industry has undergone a considerable transformation from being a Government owned enterprise to that of a competitive private environment after its liberalization in 1991. The rapid escalation in the telecom sector of India has been made possible due to the active participation of private service providers, revenue generated through Foreign Direct Investment (FDI), through the adoption of latest technologies, and series of reforms initiated by the Government.

The Indian Telecom Industry includes of various segments which are the indicator of its growth and development. It is generally divided into two segments, wire-line communication and wireless communication. Nowadays, there is a rapid growth in the field of wireless communication as compared to wire-line communication due to an increasing



demand for smartphones and interactive smart devices.

With a subscriber base of nearly 1022.61 million by the end of September 2015, India has the second largest telecom network in the world. With 375 million internet subscriptions in October 2015, India stood third highest in terms of total internet users in 2015. It is expected that India will be the second largest country in terms of internet subscribers with about 500 million internet users in the coming days. Mobile based internet is the key component of Indian internet usage, with seven out of eight users accessing the internet from their mobile phones. India's telephone subscriber base expanded at a CAGR of 19.5 per cent to 1022.61 million over FY07–16. Teledensity (defined as the number of telephone connections for every hundred individuals) increased from 17.9 in FY07 to 80.98 in FY16. In September 2015, total telephone subscription stood at 1022.61 million, while teledensity was at 80.98 percent.

Below is the graph representing the total subscriber growth and teledensity of our country till September 2015:



Source: TRAI

Telecom penetration in the nation's rural market is expected to increase to 70 percent by 2017 from 48.66 per cent as of September 2015. The government of India has introduced Digital India program under which all the sectors such as healthcare, retail, etc. will be connected through the internet. Urban teledensity stood at 152.76 per cent and rural teledensity at 48.66 percent as on September 2015. Availability of affordable smartphones and lower rates are expected to drive growth in the Indian telecom industry. There is a large disparity between the urban teledensity and rural teledensity. The slow growth in teledensity in the rural areas is due to these areas being less attractive for the telecom service providers to invest in.

Indian telecom sector's revenue grew 10.7 percent to USD71.2 billion in FY14 as compared to USD64.3 billion in FY13. Wireless and wire-line revenue increased at a CAGR of 8.91 per cent to USD38.8 billion over FY06–14.



Revenues from the telecom equipment is expected to be USD19 billion in FY15, which is further expected to touch USD30 billion in FY20. During FY07-16*, wireless subscriptions increased at a CAGR of 22.1 per cent to 969.89 million in FY15 and reached 996.66 million subscribers till September, 2015. In FY16*, urban wireless teledensity stood at 147.35 while rural wireless teledensity stood at 48.11.

India's telephone subscriber base reached 1022.61 million in September,

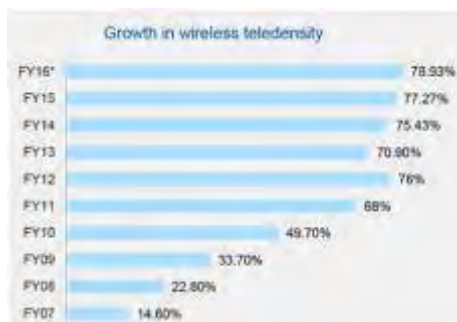


Source: TRAI



2015. The wireless segment (97.46 percent of total telephone subscriptions) dominates the market, while the wire-line segment accounts for the rest. Urban regions account for 58.58 percent of telecom subscriptions, while rural areas constitute the remaining.

The mobile segment's teledensity surged 5 times from 14.6 percent in FY07 to 77.27 percent in FY15, while coming at 78.93 percent in September 2015. GSM services continue to dominate the wireless market with a 94.91 percent share (June 2015); CDMA accounts for the remaining 5.09 percent.



Bharti Airtel is the market leader, with a 23.60 percent share of total subscription, followed by Vodafone (18.88 percent share). The top five players – Bharti Airtel, Vodafone, Idea, Reliance, and BSNL – accounts for 78.27 percent of the total subscribers.



Total fixed-line subscription stood at 25.95 million, while teledensity reached 2.06 percent due to wide usability of the wireless segment in FY16*.

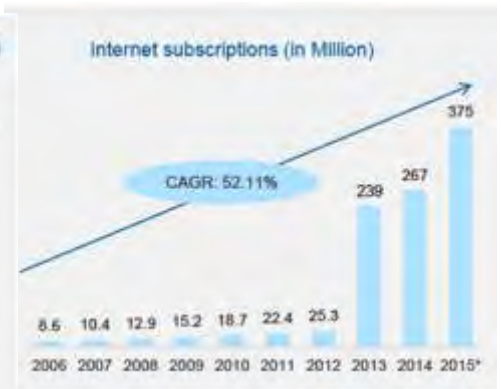


BSNL is the market leader with a 60.28 percent share, followed by MTNL (13.60 percent). BSNL, MTNL, and Bharti together account for 87.46 percent of the total fixed-line market.

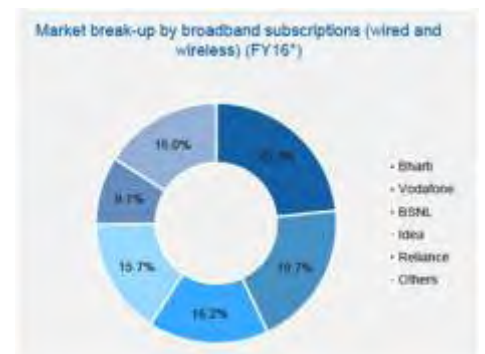


The number of Internet subscribers increased at a CAGR of 52.11 percent to 375 million in 2015 from 8.6 million in 2006. By December 2015, the number of internet users is anticipated to reach 402 million. This will reach 462 million by the end of June 2016 with the increasing number of subscribers coming online especially through mobile devices.

Wired Broadband subscription increased at a CAGR of 20.11 percent during FY07–16 (till September 2015).



Bharti has the largest share (23.3 percent) of the total broadband market. Vodafone has the second-largest share (19.7 percent) of the broadband market.



The most recent progresses in wireless communication include Broadband Wireless Access (BWA) technologies such as Wi-MAX and 4G LTE. In 2015, Airtel launched its 4G services in 296 cities across the India. In 2015, BSNL started its first 4G Wireless Broadband Internet Service like Wi-Max. Reliance Jio, has launched 4G services across pan- India. This rapid growth in the telecommunication industry is very important for the socioeconomic development of the whole country. ■

Telecom: The Perfect Storm



Increasing competition among telecom operators allowed the prices drastically down by making the mobile facility accessible to the urban class population, and to a great extent in the rural areas.

THE REVOLUTION IN the telecom sector has changed the way some businesses are handled in India. These days, there is a lot of news in the Industry about the newly Launch 3G enabled services and handsets. Telecom has empowered the small entrepreneur, whether it is a technician or an engineer, a carpenter or an electrician, it has aided the growth of companies dependent on global e-Trade. The country is entirely dependent on the instant voice and data communication offered by the telecom operators; this dependency is irreversible. This has led not only to the significant growth of the Telecom industry, but also the GDP has

increased tremendously.

According to the sources it was expected that the country's telecom market will grow rapidly. The growth has been attributed to the launch of operations in new areas such as 3G and 4G, Wi-MAX services. 4G includes Video conferencing, Voice calls, and advanced voice services, whereas Wi-MAX includes wireless connectivity. As India is a developing country with a massive population, it is seen that it is the thriving domestic telecom market and has been inviting enormous amounts of investment which is likely to speed up with the entry of new players and launch

The National Telecom Policy (NTP) has targeted 100% tele-density and 600 million broadband connections by 2020, which includes connecting 250,000 Gram Panchayats by optical fiber network.

This will translate into demand for an additional 400,000 base stations and 50,000 towers with average tenancy of 2.3 at an investment of about Rs. 50,000 Crores.

of other new services too. At present, India has become an advanced nation in the telecom market of the world with lakhs of consumers getting associated with the service every month.

From the status of state monopoly with very limited growth, it has grown into the level of an industry. Telephone, whether fixed landline or mobile, is an essential necessity for the people of India. This changing segment was possible with the economic development that followed the process of structuring the economy in the capitalistic pattern. Removal of restrictions on foreign capital investment and industrial de-licensing resulted in fast growth of this sector. In the last four years, the sector grew by 20% CAGR and the mobile subscriber base crossed 900 million, second only to China. Telecom contributes approximately 3% to India's GDP. More importantly Telecommunications, along with Information Technology, has provided the platform for acceleration of the industrial, economic and social growth of the country across all sectors.

With government of India sets up the Telecom Regulatory Authority of India in 1997, and measures to allow new service providers in the country, the featured products in the segment came into prominence. Today the telecom industry offers services such as fixed landlines, WLL, GSM mobiles, CDMA and IP services to customers. Increasing competition among telecom operators allowed the prices drastically down by making the mobile facility accessible to the urban class population, and to a great extent in the rural areas. Major telecom service providers in the sector are BSNL, MTNL, Bharti Teleservices (AirTel), Vodafone, Reliance Communications, Aircel, Tata DoCoMo, Idea, etc. With the growth of telecom services, telecom

equipment and accessories manufacturing has also grown in an enormous way.

From the time of telegraphs Indian telecom sector has witnessed an immense growth and has diversified into several segments like, wire-line Telephony, wireless telephony, GSM, CDMA, WLL and so on. The telecom industry is growing at a fast pace, introducing newer technologies. Even the network operators and handset providers are also coming up with the novel value added services and advanced technology smartphones with



multiple multimedia and professional applications. Now it's time to welcome the much-awaited 4G Technology. The technology is intended for smartphones that offers seamless Video streaming and other e-commerce services such as banking, stock transactions and e-learning will now be made possible much faster. It offers 5 to 12 Mbps speed for downloading and 2 to 5 Mbps speed for uploading, which is very high as compared to that of the 2G and 3G technology.

To boost the Indian economy, the government is precisely using telecom industry as an effective network to reach and serve the 'common man', particularly the BPL families in rural areas. The National Telecom Policy (NTP) has targeted 100% tele-density and 600 million broadband connections by 2020, which includes connecting 250,000 Gram Panchayats by optical fiber network. This

will translate into demand for an additional 400,000 base stations and 50,000 towers with average tenancy of 2.3 at an investment of about Rs. 50,000 Crores. In effect, the NTP is visualizing doubling the current telecom capacity and increasing its reach to more than 95% of India while providing a broadband level of internet capability. It is essential that the Government puts into practice its often stated goals of getting voice coverage of every Indian, and broadband data down to every Panchayat. This is essential to enable not just e-commerce, but e-Governance, e-Health and e-Education. This goal has to be used as a superseding measure for approval of all telecom policies and practices. Telecom should no longer be viewed as a golden goose. In this perspective, the government should consider a series of concrete steps that are urgently required to recreate the positive sentiment in the market and to attract Foreign Direct Investment (FDI).

Apparently, above all factors creating growth in the Telecom Industry there would be ultimately the number of experienced and skilled telecom human resources will be required for the Industry. As there are huge opportunities in the telecommunication sector that will eventually lead to the huge employment generation in the country. India will emerge as a leading player in the virtual world by having 700 million internet users of the 4.7 billion global users by 2025, as per a Microsoft report. With the government's promising regulation policies and 4G services hitting the market, the Indian telecommunication sector is likely to witness fast growth in the next few years. This will of course lead to the growth of the other sectors too, and will secure its strong place in the coming future. ■

Telecom Services

TELECOMMUNICATIONS SERVICE is the transmission, between or amongst points specified by the user, of information of the users', without change in the original form or content of the information as sent and received. In telecommunication, a Telecommunications Service Provider (TSP) is a type of communications service provider that has usually offered telephony and related services. The TSP involves incumbent local exchange carriers, competitive local exchange carriers, and mobile wireless communication companies.

A telecommunications service provider is a service provider that transports information electronically. The term like telecom, wire-line and wireless, Voice, Data, Internet, cable, satellite, and managed services businesses are encompassed in the telecommunications. The market in which a communication service provider focuses is often a function of the industry served. These industries can be divided into three categories such as telecommunications, media and entertainment, and internet or web services. The term communications service provider came into trend in the late 1990s. Prior to this time, communications were highly specified, with little overlap between traditional telecom, cellular, cable and internet companies. In the 1990s, deregulation and technology convergence began to cause massive disruption in the telecommunication industry. As companies began to offer wider portfolios of communications services, traditional categories were insufficient to describe service providers. Thus, the term Communication Service Provider (CSP) is now widely accepted as a broad category encompassing all of these businesses.

The Intelligent Network (IN) is the standard network architecture specified in the ITU-T Q.1200 series recommendations. It is intended for wire-line as well as wireless telecom networks. It allows operators to distinguish themselves by providing value-added services in addition to the standard telecom services such as Public Switched Telephone Network (PSTN), Integrated Services for Digital Network (ISDN), and Global System for Mobile communication (GSM) services on mobile phones.

Internet Service Provider (ISP) is an organization that delivers services for accessing and using the internet. Internet service providers may be organized in many forms, such as commercial, community-based, non-profit, or privately owned. Internet services normally provided by ISPs, include Internet access, Internet transit, domain name registration, web hosting, Usenet service and collocation. In 1989, the first ISPs were established in Australia and the United States.

A value-added service (VAS) is a popular term in the telecommunications industry for non-core services or in short, all services beyond standard voice calls and fax transmissions. A distinction may also be made between standard content and premium content. However, it can be used in any service industry, for service available at little cost to promote their business. In the telecommunications industry, on a conceptual level, value-added services, add value to the standard service offering, spurring the subscriber to use their phone more and allowing the operator to drive up. Mobile VAS services can be categorized into:

1. Consumer VAS
2. Network VAS
3. Enterprise VAS ▶

Internet

The ever growing popularity of the internet is dramatically changing the landscape of the telecommunications market. Until the late 1970s, introducing new services in telephone network was a slow and difficult process, requiring the modification of switch's software spread all over the network. The two cleansing waves simultaneously washed away some of this difficult process. The first wave, called the Intelligent Network (IN), provided a means to decouple service-specific software from basic call processing. The second wave, called Telecommunications Management Network (TMN), basically organized across a certain layer, the management of telecommunication equipment, thus facilitating the management of heterogeneous networks.

Due to the augmented pace of developments in the area of Telecommunications, it was quickly perceived that, irrespective of many good ideas applied in the Intelligent Network (IN) and Telecommunications Management Network (TMN) models alone, neither one, nor even their coexistence, could address all the challenges of service provisioning and network management that consumers began to pose in the early 1990's. However, by merging the best ideas of those technologies, a new architecture TINA – Telecommunications Information Networking Architecture was created by a worldwide consortium, TINA-C, formed in 1992. Thus, the two separate worlds of Internet and Telecommunications are converging and the respective advantages of the two environments are being integrated to fulfill the promise of the information super-highways.



Voice

Voice telecommunications or telephony refers to the communication of sound over a distance using wire line or wireless telephones and related technology. Telephony has its origin with telegraphy in 1844, when Samuel Morse developed the capability to send pulses of electric current over wires that spanned distances farther than one could shout, walk or ride. Alexander Graham Bell was the first person to obtain a patent, in 1876, for an "apparatus for, transmitting vocal or other sounds telegraphically", after experimenting with many primitive sound transmitters and receivers.

Telephony is one domain of telecommunications, which includes:

1. Data communications- which involves the transfer of numbers and text through the networks.
2. Video communications- which refers to the transfer of images through broadcast, cable and satellite networks.
3. Voice communications- which involves the transfer of sounds, i.e. human voice through telephone networks.

These domains are not mutually exclusive, however, because the differences between few kinds of telecommunications are beginning to disappear. For example: Fixed lines are used for telephones, fax machines, and modems. Despite the overlap, the difference between these kinds of telecommunication remains useful, since each may employ separate technology and serve different purposes.



Telephony has played and is expected to continue to play a significant and increasing role in communications and has become just as essential product to personnel and business companies, because of its use for communication among relatives, employees and customers for the distribution of information. Thus, voice communications is a resource that can improve internal and external communication, maintain good internal and external relationships, save time and money, and even can help earn money for any business enterprise. Key business applications of telephony include telemarketing, teleconferencing, and telecommuting.

Data

Data communication is termed as the transfer of data or information between a source and a receiver. The source transmits the data while the receiver receives it. The actual generation of the information is not a part of the data communications nor is the resultant

action of the information at the receiver. Data communication is involved in the transfer of data, the technique of transfer and the preservation of the data during the transfer process. Telecommunications include communication systems that are not considered as data communication systems. For Example: Telephone
Data communication is one of the fastest growing technologies in our culture today. In a world where everyone need to evolve rapidly in keeping with the changing aspects of the personal and professional world, their communication networks need to keep pace with these dynamics of the advanced data technology.



Cloud Computing

Cloud computing refers to storing and accessing of data and programs over the internet instead of your local computer's hard drive. In cloud computing, the word cloud is used as a metaphor for the internet, so the phrase cloud computing means a type of internet based computing that offers different types of services such as servers, storage and applications to ones' computers or devices through the internet.

The technology of Cloud computing uses networks of the groups of servers usually having low cost PC technology with precise connections to enable data processing tasks through them. This shared IT infrastructure contains numerous of systems that are linked together. Often, virtualization techniques are used to maximize the power of cloud computing.

The intention of cloud computing is to apply supercomputing, or high performance computing power, generally used by military and research facilities, to perform numerous of computations per second and in consumer oriented applications such as financial portfolios, to deliver modified statistics, to provide data storage or to control large, immersive online computer games and so on. ▶



THE PACE AT which telecom operators are escalating their reach and launching 4G services in India, it seems we are headed towards another telecom revolution in the country. Consumers can surely expect new services; better call quality and much more in the days to come. This in turn would further fuel the rivalry in the Indian telecom market, which means telecom industry would need to ensure that their premium clients are served better with improved quality of services. However, the telecom service providers in India will need to constantly improve and grow. The need of the hour is to address consumer's problems. A considerable example of poor service being that of call drops and a-not-so-great data network that's creating problems.

The telecom industry has penetrated the Indian market. Despite the fact, the quality of both call and data services continue to be a concern. Call drops are becoming common and slow Internet has further added up to the problem. In the recent past, call drops have become such a common issue that even the former Union Telecom Minister, Mr. Ravi Shankar Prasad was forced to take a tough stand. Of late, he has been continuously pressuring the telecom service providers to identify the gaps and fix them. Today, all telecom service providers are upgrading their services, and this could well become the game changer.

The Indian telecom industry is expected to become bigger and better. PwC predicts several key trends; all that point towards an increasing competition in the telecom industry. For consumers, the recent hike in tariffs will continue, irrespective of the cost of frequency bands

The Future of Indian Telecom Industry



The Indian telecom industry is expected to become bigger and better. PwC predicts several key trends; all that point towards an increasing competition in the telecom industry.

in the recent auctions, as all operators have stopped playing the price game. Besides, telecom service providers are also actively cutting down on freebies, the free minutes that most tariff plans offer.

Reliance Jio is likely to open up its services to consumers across the country by 2016 while other telecom firm up their

plans to expand 4G services and announce attractive packages to help consumers switch easily to faster and better services. Airtel and Vodafone have just completed the first phase of their planned 4G in the country successfully. While, users will also have Idea Cellular 4G services to choose from; the telecom firm might introduce its 4G services in 750 cities across 10 circles by the time, which means consumers will have plenty of options.

The current period looks thrilling for the telecom industry, but the promotional promises and data network offered won't do much if the call drop issue is not addressed efficiently. ■

Telecom companies in India

TELECOMMUNICATION companies in India are on the ever rising trend and there has been a stunning growth in this sector over the last decade. The telecommunication industry in India is one of the fastest growing industries in the world. India has the third largest (based on the total number of fixed/mobile subscriber lines) telecom network in the world and the second largest mobile network with over a billion subscribers.

The Indian telecommunication strategies were further modified to introduce more private telecom operators in the market. Several private companies such as Airtel, Vodafone, Reliance Communications, Aircel, Tata DoCoMo, and Idea Cellular joined the Indian telecommunication market. India's mobile phone subscriber base crested the 1 billion subscribers' mark, as per the data released recently by the country's telecom regulator (TRAI).

Some of the leading steps:

- In 1975, the Department of Telecom (DoT) was given separate authority for regulating the telephone services in the country.
- In 1985, the Mahanagar Telephone Nigam Limited (MTNL) commenced its services for carrying out the telephone operations in the metros of India, viz. Delhi and Mumbai.
- In October 2000, the Bharat Sanchar Nigam Limited (BSNL) was set up by the Department of Telecom (DoT).
- Later, several private companies as Reliance Communications, Tata DoCoMo, Airtel, Aircel and Idea

Cellular etc. in the telecom sector came up.

The state owned Bharat Sanchar Nigam Limited (BSNL) is the pioneer in the telecom market of India.

Major Telecom Companies in India:

BSNL

In 2000, the Bharat Sanchar Nigam Limited (BSNL) cellular service was set up. It is a state owned telecom company with its headquarters located in New Delhi. BSNL is also the largest land line telephone and sixth largest mobile telephony provider in India. As of June, 2015 over 93.29 million users have been reported to be as BSNL users.

MTNL

Mahanagar Telephone Nigam Limited (MTNL) was set up in the year 1985, to run telecom operations in the major metro cities of India, Mumbai and Delhi. Its

headquarters is based in Mumbai. MTNL was the first company in India to initiate 3G services in India, having the brand name of "MTNL 3G Jadoo Services" which provided services as Video call, Mobile TV, Mobile Broadband etc. to the customers.

AirTel

AirTel, founded by Sunil Mittal, also known as Bharti Airtel Limited started in July 1995, with its head office based in New Delhi. Airtel runs its operations in as many as 20 countries across the world and is also ranked first in India and fifth as a telecom service provider globally. As of February 2016, figures show that Airtel has over 248.69million users, which make it the biggest mobile service operator in India. Its service includes both 2G, 3G and 4G facilities.

Vodafone Essar

Vodafone Essar founded in 1994, is the second largest operator in India with its head office in Mumbai. Vodafone

provides services to 23 telecom circles across India. As of

February 2016, figures show that Vodafone India has over 196.74 million users. Its service

includes both 2G, 3G and 4G facilities.



**Road Ahead
for Indian
Telecom companies**

Idea Cellular

Idea Cellular started in 1995, is the third largest operator in India with its head office in Mumbai. It also provides 2G, 3G and 4G services to its subscribers. As of February 2016, figures show that Vodafone India has over 174.62 million users.

Tata DoCoMo

The Tata Teleservices founded in 1996, with its headquarters in Navi Mumbai.



MTS

Mobile TeleSystems (MTS) is a subsidiary of Sistema a Russian conglomerate was started in 2008, with its headquarters in New Delhi. MTS provides wireless voice, messaging, broadband Internet and data services in India. The company has more than 16 million customers.

Reliance Communications

Also known as RCOM was founded in 2004, with its head office in Navi Mumbai. Reliance Communications as of now has more than 134 million users all across the country.

Aircel

Aircel founded in 1999, with its head office in New Delhi. It is a joint venture between Maxis Communications and the Apollo Hospitals.

Telenor

This Company is a joint venture between Telenor Group and Unitech Group and was started in 2009. The company has over 44 million users in Goa, Gujarat, Andhra Pradesh, Telangana, Uttarakhand, Bihar, Uttar Pradesh, Jharkhand and Maharashtra. ▶

TELEMARKETING

TELEMARKETING IS ONE of the common form of marketing, companies use to connect with existing or potential customers for their products or services. Generally, telemarketing consisted of companies making phone calls or messages to existing or potential customers. With the evolution of technology, telemarketing has continued to include emails and video conferencing calls as well, though those are generally conducted with existing customers. Telemarketing is often used to sell a product or service, but it can also take the form of surveys or information gathering. For instance, political campaigns use telemarketing profoundly prior to elections to inquire about voting preferences.

Companies can have a list of potential and existing customers to call from a list service, which will provide a list of consumers who have similar interests or buying histories who fit the company's target market.

There are many industries that rely heavily on telemarketing, such as:

- Retail Promotion services
- Financial services
- Vacation and Holiday services
- Property services
- Recruitment and Consultancy services

The Telecom Regulatory Authority of India (TRAI) has issued "The Telecom Commercial Communications Customer Preference Regulations (TCCCPR) 2010" on 1st December 2010. The new regulations have been designed with the motive of promoting customer satisfaction by way of giving the customer choice to opt for no promotions or selective promotions of their choice. There are certain procedures and guidelines that govern how companies can telemarket their products or services. One type of these laws protects cell phone users from receiving telemarketing calls to their cell numbers is Do Not Disturb (DND) initiative. DND registry offers a customer to avoid such unwanted telemarketing calls or SMS. ▶



WITH THE EVOLUTION of the Internet, communication service providers considered their network as little more than a dumb network. The Internet of Things (IoT) revolution, demanding a dramatic surge in strong, secure communication networks. The Internet of Things offers providers an opening to not only play a larger role, but to create new value such as open many new doors for telecommunication companies to explore additional revenue streams and better customer relationships. Telecom service provider across the world faces tough market conditions as a result of growing competition from over-the-top players, high subscriber churn rates, and dropping margins. The telecom industry today experiences an enormous opportunity to provide more value in an economy progressively driven by connecting devices. Industry experts highlight the profitable areas for telecom service provider to pursue the Internet of Things and the multifaceted customer experience issues that will need to be addressed.

The Internet of Things (IoT) has become gradually visible, due to the rise of interactive fitness devices, intelligent sensors, and the promise of autonomous vehicles. These technologies are convincing because they make the things around us smarter and more interactive. The Internet of things offers the telecom service provider a wide variety of possibilities to explore. Initiating with network connectivity, carriers could provide the setup to connect more equipment, gears, sensors and devices. These sensor technologies make things smart; are only part of the Internet of Things (IoT). The rise of smart, connected gears from wearable activity trackers to connected cars, allows service providers to compete not only on the performance and functionality of their products or services, but also on the information created by the use of these products or services.

When the Internet emerged, most online services connected people, and there was a comparatively high tolerance for low or variable quality because people are good at handling with dormancy, errors or failure. Unlike people, even

The Internet of Things in Telecom



smart machines are poorly equipped to deal with these same communication issues. In other words, dumb networks are sufficient when connecting people; smarter networks become more important when connecting things. As with many technologies, the prices of IoT-enabled sensors are falling. In commercial applications, replacing existing sensors nevertheless can be expensive. More intimidating, wholesale replacement can require rethinking a business process. This combination of cost, asset life cycle, and inactivity means that many solutions will rely on existing sensors improved with either communication capabilities or additional sensors.

In a best-efforts telecommunications network, the customer basically gets what is available. There are no promises on data speed, openness, accessibility, error rates, or other performance characteristics. For several services, such as uploading, downloading or streaming content, this can prove annoying. Nearly everyone has experienced delays while the viewing software waits for the missing bit stream to arrive, or been forced to reboot when an Internet-based application freezes.

At present, almost all wireless connections provide a best-effort style of communications. In other words, the connectivity, accessibility, data transfer rate, packet loss rates, and latency are subject to

the vagaries of contention for capacity among users, interference, and wave propagation.

In contrast, a managed telecommunications solution shifts to the communication service providers (CSPs) the responsibility of ensuring a reliable bitstream, opening the door to customer applications that demand consistent real-time or near-real-time connectivity over wide distances or other similarly demanding constraints. The International Telecommunications Union (ITU) identifies three dimensions of managed services.

- **Grade of Service (GoS):** This explains the physical connection's availability and performance and measures characteristics such as coverage, capacity, and the probability of a network outage.

- **Quality of Service (QoS):** This describes the traffic flow's performance and allows an application to specify its needs according to attributes such as latency, dropped calls, dropped packet performance, error rates, and guaranteed data (bit rate).

■ **Quality of Experience (QoE):** This link to users' experience of using a service. It is a subjective assessment of the user's experience with the service and thus brings in the communications network, the terminals, ease of use, and so on. ▶

Call drops: Telecom operators promise action

POOJA
KHAITAN

The mobile operators have promised to add **60,000** new cell sites where they need to improve their quality of service.

Telecom industry assured the DoT that it will accelerate and redeploy their plan, meaning with that of Rs 52,000 crore of capital expenditure it would spend Rs 12,000 crore over the course of the next three months in putting up 60,000 towers of the 100,000 it plans to put during the year.

Call Drop Compensation

- Mobile users will get a compensation of **Re 1** for every dropped call from January 1
- Compensation would be provided to a subscriber for a **maximum three dropped calls in a day**
- New rules can cost the Telcos nearly Rs 150 crore a day
- Telecom regulator TRAI announced the new norms following a huge uproar over the menace of call drops

PREPAID
Message to the customer **within four hours** of a dropped call with details of the amount credited to his or her account

POSTPAID
Details of the credit to be provided in the next bill

We hope that it will go a long way in addressing the concerns of the consumers

Telecom Minister
Ravi Shankar Prasad

A CONNECTED CALL may be terminated or disconnected due to a technical glitch before the parties making the call would wish to do so (in ordinary phone calls this would mean before either of the parties has hung up). Such calls are considered as dropped calls. The dropped-call rate in traditional i.e. landline networks is extremely low and is significantly less than 0.01%. In mobile communication systems using the electromagnetic waves the dropped-call rate is higher and may range for commercial networks between 0.1% and a few percent. The basic causes for dropping calls in mobile networks are lack of network coverage (radio wave strength) either in the downlink or the uplink and the radio interference between different subscribers. The telecom companies have assured the government that they are doing their best and will continue its efforts to check the menace of call drops even as the latter promised that it will try to resolve all the teething issues.

Recently, at a meeting with JS Deepak, secretary at the Department of Telecommunications (DoT), the CEOs of telecom operators said that they will accelerate and redeploy their planned capital expenditure and other resources to check call drops. The meeting, which comprised Gopal Vittal of Bharti Airtel, Sunil Sood of Vodafone India, Himanshu Kapania of Idea Cellular along with Rajan Mathews of the Cellular Operators Association of India, among others, was the first between the DoT and the industry bigwigs since the Supreme Court quashed the Re 1 charge the Telecom Regulatory Authority of India had mandated the operators to pay to the consumers for every dropped call.

Telecom industry assured the DoT that it will accelerate and redeploy their plan, meaning with that of Rs 52,000 crore of capital expenditure it would spend Rs 12,000 crore over the course of the next three months in putting up 60,000 towers of the 100,000 it plans to put during the year. Of this, 100 new sites will be put in Delhi during the next three months. "The mobile operators have promised to add 60,000 new cell sites where they need to improve their quality of service," Deepak said after the meeting, adding that the problem of call drops required a more sophisticated solution and that there was no magic bullet to resolve it.

"The customer experience should not only be in the area of call drop, but also in the space of data services. We are not anywhere close to experience required for success of Digital India initiative of the Prime Minister," Union Minister Manoj Sinha said. The government is gearing up for the largest spectrum auction, estimated to be worth Rs 5.66 lakh crore, wherein as much as 2300 megahertz of radio waves will be put up for sale across frequency bands. Telecom operators have also sought the opening up of new frequency bands i.e. 71-76 gigahertz (GHz) and 50 GHz. Wireless services deployed in these bands are considered to deliver

broadband speed of up to 1 gigabyte per second as in the case of optical fibers. Sinha told the operators that spectrum auction will be conducted in September and it will resolve spectrum shortage problem in the industry.

Sinha said the government is studying a proposal of Telecom Regulatory Authority of India that aims at strengthening present consumer grievance redressal system and giving more powers to the regulator. ■

We are not anywhere close to experience required for success of Digital India initiative of the Prime Minister.

– Union Minister Manoj Sinha

5 million preventable
deaths occur every
year



Helpline
1800-11-0456

Reach out to us before
you are one of them

Standards of the G's



The 'G' stands for Generation, as in the next generation of wireless technologies. Each generation is theoretically faster, more secure and more reliable. The consistency factor is the toughest hurdle to overcome. 1G or the 1st generation was not used to identify wireless technology until 2G, or the second generation, was released. When the wireless networks went from analog to digital, it was considered a major evolution of the wireless telecommunication technology. After then, 3G and 4G came along and offered faster data transfer speeds, at least 200 Kbps and 100 Mbps respectively, for multi-media use and still a most preferred standard for wireless transmissions.

It is still a challenge to get a true 4G connection, which promises upwards of a 1Gbps, Gigabit per second, transfer rate if you are at the perfect location. 4G LTE comes very close to closing this gap. True 4G may not be available on a widespread basis until the next generation arrives, i.e. 5G.

Standards of the G's

Each of the Generations has standards that must be met to legally use the G terminology. Those standards are set by ITU Radiocommunication Sector (ITU-R), one of the three sectors International Telecommunication Union.

■ **1G** – This was the first generation of cell phone technology. Simple phone calls were all it was able to do. The term '1G' never widely used until 2G was available.

The speed and standards of this technology of wireless needs to be at least 100 Mbps and up to 1 Gbps, to pass as 4G. It also needs to share the network resources to support more simultaneous connections on the cell. As it develops, 4G could surpass the speed of the average wireless broadband home Internet connection. Few devices were capable of the full throttle when the technology was first released. Coverage of true 4G was limited to large metropolitan areas. Outside of the covered areas, 4G phones regressed to the 3G standards. When 4G first became available, it was simply a little faster than 3G.



1G
1981

2G
1992

3G
2001

4G
2011

5G
2020

■ **2G** – The second generation of cell phone voice and message transmission. Second Generation digital systems can be classified by their multiple access techniques as Frequency Division Multiple Access (FDMA), Time Division Multiple Access (TDMA), or Code division Multiple Access (CDMA). The General Packet Radio Service (GPRS) and Enhanced Data rates for GSM Evolution (EDGE) could provide data rates from 56 kbps up to 115 kbps. It can be used for services such as Wireless Application Protocol (WAP) access, Multimedia Messaging Service (MMS), and for Internet communication services such as email and World Wide Web access.

■ **3G** – This generation sets the standards for most of the wireless technology, we have come to know and love. Services include wide area wireless voice telephony, video calls, Web browsing, email, video downloading, picture sharing and other Smartphone technology all in a mobile environment. Additional features also include High-Speed Packet Access (HSPA) data transmission capabilities able to deliver speeds up to 14.4Mbit/s on the downlink and 5.8Mbit/s on the uplink.

■ **4G** – 4G refers to the fourth generation of cellular wireless standards. It is a successor to 3G and 2G families of standards.

■ **4G LTE (Long Term Evolution)** – 4G LTE is not the same as 4G, LTE sounds better. This buzzword is a version of 4G that is fast becoming the latest

technology and is getting very close to the speeds needed as the standards are set. The expectation for the 4G technology is basically the best quality audio/video streaming over end to end

Internet Protocol. In the coming days, we must experience XLTE which is a bandwidth charger with a minimum of double the bandwidth of 4G LTE and is available anywhere the

Advanced Wireless Services (AWS) spectrum is initiated.

■ **5G** – There are rumors of 5G being tested, although the specifications of 5G have not been formally clarified. We can expect that new technology to be rolled out around 2020 but in this fast-paced world, it will probably be much sooner than that. Seems like a long ways away, but time flies and so will 5G at speeds of 1-10Gbps. ▶





Wire-line Telecom

A WIRE-LINE NETWORK comprises of interlinked connection and redistribution systems. The network allows information like voice and data to travel electronically. Traditionally, local and long distance telephony, including voice calls, messaging, and fax were the primary wire-line services. They were transmitted, over a

network of copper wires and switches. These wires and switches were used as the medium to connect calls between the users.

In terms of infrastructure, there's a trend to adopt new technologies to increase bandwidth over the wire-line network. Previously, telecom companies provided Internet connectivity to users over the copper network. It was combined with a high-speed fiber component through a basic DSL (Digital Subscriber Line). Today, these copper wire has been replaced by an efficient and high capacity physical medium called optical fibers to transmit information. Today, wire-line network includes the optical fiber infrastructure connecting traditional landlines and modems. It mainly includes the broadband network delivering VoIP (Voice over Internet Protocol), Internet, TV services, and managed private communications. Broadband infrastructure is a critical resource for economic development in Telecommunication. ▶

WIRELESS TELECOMMUNICATION came into existence many years after the wire-line telecommunication. However, wireless became more significant during the last decade. It became particularly important after the beginning of the third generation, or 3G, in 2003. 3G wireless had data capabilities that helped wireless companies to compete with wire-line. However, wireless networks continued to face unique challenges, such as managing broadband speeds and network traffic.

The wireless network is also called the cellular network. It makes your mobile and smartphones work over radio signals. The entire wireless coverage area is divided into small cells. Each cell has at least one base station or cell tower. Each cell works at a frequency of radio signals. Mobile phone subscribers can use the network for voice and data services, even if they're moving between these cells. If a particular cell is congested with traffic, mobile users get the nearest available tower to communicate. ▶

Wireless Telecom



Consumer's decision to adapt innovative services

The recent impressive development of telecommunications technology has led to the convergence of communications systems, which has enabled the creation of a common marketplace. Outdated systems in the consumer technology value chain are blurring as the convergence of devices, software, services, and content becomes a reality. This incredibly consumer-focused impetus is setting a pace of innovation that is affecting both the consumer and telecom industry. Operators, coming from different communications markets, have to compete for a market share in the new market. In this market, similar services in terms of use and value for the consumer are available. These services are supposed by the consumer as substitutes. For example, if a consumer watches an episode of a TV series on Internet TV on his/her PC or Smartphone, it decreases the use of cable TV.

The decision to adapt by emphasizing the significance of the one's technical competences and thus, the technology complexity may not fully address the current market dynamics. In the current market, consumers have to choose between service options of the same level of technical complexity which requires similar technical skills and are available in a particular context of use. Then, the person's decision ideas are likely to be value-driven. Today's consumers are, of course, very active in the digital world in both

the developed and developing countries while actively continuing to move away from conventional voice calls to data and app usage. Despite the impression that Indian consumers are ahead of the pack, but how they use their phones is quite different. Consumers seem to be more focused on saving money, using apps for calls and buying products and services from online sellers such as electronics, books, and clothes, etc. Apps for calls are most popular in the country such as Skype, Whatsapp, etc.

Consumer Issues in Telecom Industry

Multiple issues plague the telecom industry and its growth in the country, and the following is one of the most prominent issues faced by the consumers in order to stem the rot in the sector.

Fading Network Quality and Congestion:

The major consumer issues are increased network congestion and the Quality of Service (QoS). This problem is mostly aggravated in densely populated regions and during peak times. The main reason for this problem is that the service providers have not scaled up their telecom network set up in proportion to the increased network usage. The latter is a direct consequence of the increased number of users and increased number of calls made by these users.

Further, Telecom service providers have not given due importance to this issue as the basis of competition in this industry in India is the pricing and not the Quality of Service. This allows the service providers to try and increase their user base as much as possible without investing enough in network substructure.

Having the most reliable network in terms of the fewest dropped calls and outages, and constant access to data is extremely the most important attribute in terms of network choice. Operators have a big responsibility to meet the desires of their customers on voice, data and the internet. However, price and network quality are the dominant factors for how consumers select their operators. ■



“

UNIVERSAL HEALTH
COVERAGE

Join our
initiative of
access to
Quality
Healthcare
for all

”



24X7 toll free 1800-11-4424

**PATIENT SAFETY AND ACCESS
INITIATIVE OF INDIA FOUNDATION**

a Partnership for Safe Medicines India Initiative

35,000+ HAPPY CONSUMERS

Together WE CAN make a difference

www.consumerconexion.org

Toll free # 1800-11-4424

