

Broadband and Telecom Market in India

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Mr. Peter Ford, Session Chairman

Let me introduce to you our next speaker, Mr. Rakesh Kumar Upadhyay. He has been working as Chairman & Managing Director of BSNL since April 30, 2011. He has accomplished 36 years of service in the telecom sector in various offices and public sector undertakings, under the Ministry of Communications and IT, Government of India. He has a B.Tech in Electronics Engineering from IT, Banaras Hindu University (BHU) and is also a graduate of Defence Services Staff College, Wellington and has a M.Sc. (DS) degree from Madras University. Mr. Upadhyay has an MBA in Marketing Management from Indira Gandhi Open University. Mr. Upadhyay, please take the floor.

Mr. Rakesh Kumar Upadhyay

Thank you Mr. Ford. Ladies and gentlemen, it is a privilege and matter of great honour for me to have been given an opportunity to address the august gathering here this morning.

The Indian telecommunication network is the third largest in the world and the second largest among the emerging economies of Asia. The Indian telecom sector continues to record noteworthy success and has emerged as one of the key sectors that have been accountable for the growth of Indian economy. The rapid growth of the telecom sector with proactive government policies and decisions, a very fair regulatory framework along with the dynamic involvement of the private sector has facilitated Indian consumers' very easy access to telecom services at very affordable prices.

India is all set to move on from 3G to 4G. With mass adoption, lowest cost per bit, highest capacity, best user experience and true global standards, the world has stepped into 4G expecting more than 450 million customers by 2015. India could lead 4G broadband technology developments as India has a lot of competence in this particular area.

Telecommunication has emerged as a key driver of economic and social development and in an increasingly knowledge intensive global scenario, India needs to play a leadership role. The national telecom policy, the draft of which was unveiled recently - called "A Draft National Telecom Policy 2011" - is designed to transform the socio-economic scenario through accelerated, equitable and inclusive economic growth by laying special emphasis on providing affordable and quality telecommunication services in rural and urban areas of India.

The Draft NTP 2011 recognizes that the rapid growth of the telecom sector must be supported by an enhanced pace of human capital formation and capacity building. It becomes imperative to put in place an intelligent, integrated skill development strategy for the converged information & communication technology (ICT) sector as a whole, so that there is a continuous upgrading of skills in tune with the technological developments.

The Draft National Telecom Policy 2011 also envisions providing the people of India a secure, reliable, affordable and high quality converged telecommunication service anytime, anywhere. Some of the important objectives of the policy include:

Increasing rural tele-density from the current level of around 35 to 60 by the year 2017 and 100 by the year 2020. Currently, the tele-density in India in urban areas is about 164, but in rural areas is only about 34, so therefore the new telecom policy 2011 lays special emphasis on increasing the tele-density in rural areas.

Provide affordable and reliable broadband on demand by the year 2015 and to achieve 175 million broadband connections by the year 2017 and 600 million by the year 2020 at minimum 2 Mbps download speed and making available higher speeds of at least 100 Mbps on demand.

Provide high speed and high quality broadband access to all village panchayats through optical fiber by the year 2014 and progressively to all villages and habitations.

It also envisages promoting indigenous R&D, innovation and manufacturing that serve domestic and foreign markets.

Promote the domestic production of telecommunication equipment to meet 80% of the Indian telecom sector demand through domestic manufacturing with a value addition of 65% by the year 2020.

Facilitate consolidation in the converged telecom service sector while ensuring sufficient competition.

Ensure adequate availability of the spectrum and its allocation. Make available an additional 300 MHz of spectrum for International Mobile

Telephony (IMT) services by the year 2017 and another 200 MHz by the year 2020.

We strive to create “one nation, one license” concept across services and service areas.

The government has the objective to provide telecom services and telecom infrastructure in panchayats and villages – that is the main emphasis. The panchayats will be connected with high-speed broadband. This will facilitate the villagers to provide triple play services – voice, video and data - cable TV and IP TV services for entertainment and farming education, railway ticketing, land records, live market information, e-healthcare, tele-education etc. The high-speed broadband will enable the government to implement the true Panchayati Raj, the dream of the father of the nation Mahatma Gandhi-ji. This will also help enroute to bring high-speed broadband connectivity to every secondary school, health center or gram panchayat on demand. This will help in achieving the government’s objective of doubling the rural tele-density from the present level of approximately 20% in the next three years and make a real difference in the lives of our farmers, by enabling them to discover prices for their produce in the nearby local markets.

The government of India has already constituted the USOF, when they opened the telecom sector. The Universal Service Obligation Fund - the USOF as we call it popularly - is to be utilized exclusively for meeting the service obligation by providing access to telegraph services to people in rural and remote areas at affordable and reasonable prices. The USO Fund was established with the fundamental objective of providing access to basic telegraph services and now includes provision of broadband connectivity to villages in a phased manner, creation of general infrastructure in rural and remote areas for development of telecom facilities, introduction of new technological developments in the telecom sector in rural and remote areas.

In this connection I would like to make a special mention of a new scheme of the government of India, which is NOFA, called National Optical Fiber Agency. In a very active stage of consideration by the government and very soon this network will be sanctioned. Hereby a national optical fiber network will be set up, which would greatly facilitate inclusive growth in the country by including the large rural population in governance and decision-making processes and extend to the rural areas better education, health and banking facilities.

Essentially, NOFA has been conceived as a totally government funded project and the aim is to provide optical fiber connectivity to every village panjayat by creating an incremental optical fiber network utilizing the existing optical fiber backbone network of various companies, various organizations and then make fiber connectivity from the edge of that network. It is expected that in the next two years this network will be ready, totally funded by the government and thereafter it would be available to all

the telecom service providers in a non-discriminatory, transparent manner to use this network and provide various telecom facilities to the villages.

It envisages 75 million broadband connections, 17 million DSL and 30 million cables and 28 million wireless broadband by the year 2012 and 160 million broadband connections by the year 2014. The program is expected to bring immense benefits when fully operational. The estimated revenue of NOFA is going to be about 260 billion rupees per year. The network will provide easy access to high-speed data and information to citizens, promoting thereby their efforts in the field of education and health, etc.

Coming to Bharat Sanchar Nigam Limited (BSNL) in India, BSNL has been the leader in the thrust to expand optical fiber networks in the country and offer FTTH / FTTP technology. As the largest service provider of fixed line connections in the country and having a network of about 7 million kilometers of optical fibers in the country, BSNL has been the obvious choice to push this FTTH technology further.

There are two main considerations to push the growth of this technology into the country. The first is commercial considerations, which are dependent on a critical mass of customers being available or possibly available in the near term to justify the expenditure incurred in spreading the reach. The second – and in our country the more important – consideration is to remove the asymmetry of information and opportunities available to the rural population while dramatically improving the quality of public civil service available to our teeming millions.

The rural connectivity is of paramount importance to the government to effectively manage the implementation of social sector schemes at the rural level in the country. At present around 1000 billion rupees on an average annual basis, for implementation of these schemes, is being made available by the government of India. It is essential to ensure that the benefit of these schemes reach the targeted beneficiaries.

BSNL has continued its growth story every year since its formation and has plans to increase its customer base from 28.11 million as of 31st March 2001 to 160 million by March 2014. BSNL has started 3G services in about 290 cities and has acquired more than 1 million customers of 3G. We are in the process of rolling out 3G services in about 760 more cities across the country.

Broadband is perceived to be a tool for improvement in the lives of the people by providing affordable and equitable access to information and knowledge and contributing to making them eco-friendly. For individuals broadband has a direct impact on their day-to-day lifestyle and behavior. For the state it contributes enormously towards trade and generation of employment. Governments find it is a powerful tool to manage municipal services, provide improved governance, increase the participation of people in democracy and effectively monitor implementation of rural development projects.

As on the date, BSNL has about 12 million broadband connections, which

comprise both fixed and mobile broadband. We are the market leaders of broadband in the country. These 12 million broadband connections account for about 50% of the total market share. BSNL has about 120 million telephone lines, both landline and mobile combined.

As per the Draft National Telecom Policy 2011, which I mentioned before, about 600 million broadband connections are to be deployed by the year 2020 under the mission "Broadband for All". It is anticipated that if BSNL maintains this market share in the future also, BSNL will have an ultimate broadband customer basis of 300 million by the year 2020, out of a projected basis of 600 million.

As per a recent Socio-economic Impact of Mobile (SIM) survey on the trend in the number of internet users, it is also anticipated that the number of connections to achieve the goal of "Broadband for All" will be increased by 20 times of the present capacity in terms of the number of connections. Also, with more and more use of bandwidth hungry applications, such as video centric applications, average bandwidth consumption may have at least a tenfold growth. It is also anticipated that the requirement to cater for the above needs for bandwidth at the international gateways, this also will have to be increased. However, with more and more availability of local contents and their hosting in the servers within India, the international internet bandwidth requirement will actually be reduced slightly.

In other words, the existing internet pipe at the international gateways of the existing 100 GB capacity of BSNL should be augmented to about a minimum of 1 TB. Local servers hosted within India will handle an additional 1 TB capacity. To cater for such a huge internet bandwidth of about 2 TB per sec., once again BSNL has to gear up to provide adequate necessary infrastructure such as augmentation of the present core network with at least 4 TB based backbone links. Accordingly, the DWDM systems within the core network of BSNL with a built-in digital cross-connect facility has to be primed to achieve the ultimate goal of the government's mission "Broadband for All". The existing optical fiber cables in the core network of BSNL are gradually deteriorating due to aging as well as frequent damages due to the huge number of infrastructural project works such as national highway road expansions and the Jawaharlal Nehru Urban Renewal Mission. This is likely to necessitate the build-up of a new infrastructure capable of handling 40 GB to 100 GB of carrying capacity. In other words, each system or link is supposed to provide bandwidths of multiple TB/sec.

In a similar way, present BSNL access network and aggregation network also have to be enhanced to about 20 times of present capacity in terms of number of connections, public ports as well as bandwidth. The existing multiprotocol label switching (MPLS) network infrastructure of BSNL is also required to be enhanced accordingly with an adequate capacity of MPLS routers in terms of number of ports as well as bandwidth handling capability. This will facilitate the termination of an adequate number of high capacity pipes such as 10 GB. The present MPLS router capacity is 30 GB with backplane capacity of 300 GB. BSNL is planning to fully exploit the

present capacity and possibly to upgrade to 1TB.

We are also in the advanced stage of procuring a Comprehensive Perl Archive Network (CPAN). It is being planned by BSNL as an aggregate network to accommodate targeted broadband growth and bridge the constraints of the present access network and aggregation network through MPLS in the Next Generation Network (NGN) platform. As regarding the expansion of the core network, BSNL is planning to procure about 1.5 lakhs route kilometers of optical fiber cables in the next few years. Over and above, the Department of Telecommunication under the National Optical Fiber Authority (NOFA) project, which I mentioned before, is contemplating to lay an optical fiber cable network of about 500,000 route kilometers, especially to bridge the gap in the last mile to interconnect about all 2.5 lakhs village panchayats with the nearest exchanges where an optical fiber cable is already terminated.

Fiber to the home is currently gaining momentum in India thanks to the farsighted vision of the stakeholders, service providers, cable vendors, equipment vendors and system integrators to deploy next generation networks. FTTH is a topic that has been discussed across the globe and the United States has been a pioneer in adopting FTTH technologies for triple play services becoming a leading market for cable vendors.

In India, so far FTTH has been underplayed by the government and network operators as they have been concerned primarily with data services but not voice and video services. However, for the last three years, there has been much activity on the voice and video fronts also, because Voice over Internet Protocol (VoIP) is now open to the public, which was not there before.

India is at a crossroad in telecommunication technology with 3G and FTTH networks being rolled out. FTTH will give subscribers limitless possibilities.

There are several factors, which will play into lowering the cost of FTTH deployment. One is standards compatibility. When equipment can be designed for inter-operability, this lowers the cost for carriers, for system OEM's and ultimately for the consumers. Another is the possibility to pack more features, higher performance and scalability into the FTTH components themselves.

Fiber has already become a dominant medium in metro and backbone networks in India. Fiber-to-the-home is an umbrella term, which is used for emerging access networks that use optical fiber in the first or last mile. In a techno-economic sense, the advantages of FTTH networks over other telecommunication networks is their long reach and extensive capacity. Fiber has a virtually unlimited bandwidth capacity and is therefore capable of meeting increasing traffic demand of multimedia services and thus providing a future-proof or future-safe medium, which outperforms all other known media.

Looking at India's huge population FTTH is set to find a niche market for a period of time. BSNL is already in the process of deploying FTTH

technology in 105 cities across India, with an investment exceeding 10 billion rupees. The FTTH installations have already started in various cities. We are also providing triple-play services of high-speed internet, VoIP, IP-TV solutions and other value-added services to the high-end customers through this FTTH. We are already providing these services through copper line broadband to its customers as well. All state headquarters are part of the first phase of FTTH deployment in our network.

The state player has a clear target in mind, namely to be able to provide IPTV services through the copper cables, and is in the process of connecting their base of customers to FTTH. BSNL will adopt FTTH directly to the home and in the case of gated communities or high-rise apartment complexes; its fiber will directly reach customers' home individually.

Coming to the fiber demand in India. Industry estimates that the market for FTTH services would be much higher than the US simply because of the huge size of the population in India. FTTH has already passed the trial and acceptance stage. India has successfully broken the myth that high-end technologies cannot be offered at an affordable cost to the masses. We were able to create volumes, critical mass and base that could bring down the costs dramatically. As several technologies have niche benefits for users, FTTH will find its own niche market. Particularly, when cost of services comes down, users can easily afford to have FTTH services at home, even though they might use other services such as cable TV as well.

As the prices of equipment are also cheaper now as compared to the past, the FTTH take-off will be greatly encouraged.

Though copper cables like CAT7 can be used for high bandwidth transmissions, they have disadvantages like the requirement of much intense copper cables, alien cross talk and very high prices for deployment. Also the lifespan of the copper cable is much less than fiber, which can accommodate any increased bandwidth requirements for high-speed data transmission in the future. So fiber optic will become commodity, whilst copper cable like CAT6 may become a specialty. Fiber also has duplex transmission ability, which means that signals can be transmitted both ways from exchange to the customer and vice-versa, which plays a vital role in applications like in interactive IP-TV.

Laying out cable in brownfield areas is a challenge. If it is a greenfield apartment we can do pre-wiring, which is easy to carry out; but in a brownfield scenario fiber deployment is not easy.

Another concern, that service providers including BSNL have, is that they are not sure about how customers will view the high cost of FTTH services. Though cost would be higher initially, but when we add more customers the cost will definitely come down. That's where we are in touch with the government to be a kind of anchor client for our FTTH deployment, so that the government centered services, the so-called government to client (G to C) services, will facilitate the proliferation of the technology in the country.

In countries like Japan, Thailand and Italy the FTTH infrastructure is built

subsequently when new colonies and high-rise buildings are developed and a particular distribution model is adopted. But in the United States, a different model of fiber distribution is adopted, as the houses are generally scattered. In India, we have a mix of both models. We have scattered households as well as high-rise apartments.

India cannot go for pure play FTTH, as we see it in the US, as the Indian geography is very complex. India has metros like Mumbai, Chennai and Delhi, where there is a dense population and there is already a fairly deep running copper network in existence. On the other hand, we also find new townships being developed. In this mixed scenario we have to use a mix of existing copper lines to some extent in brownfield deployments and fiber straight to the home in greenfield deployments.

The Indian telecom cable industry has to gear up for the above requirement of supplying optical fiber cable for the immediate requirement of BSNL and other service providers towards achieving our mission “Broadband for All”, as well as meeting various defense project requirements.

From the perspective of the cable manufacturing industry, it is presumed that for feasibility of their cable manufacturing plant a minimum fiber kilometer per month production capacity is required. With this, it is presumed that the existing cable manufacturers in India will upgrade their plants to meet such a huge requirement of BSNL as well as NOFN – National Optical Fiber Network – requirement. Over and above these requirements an alternative defense network with a requirement of about 60,000 route kilometer of optical fiber cables is also in the pipeline.

Presently in the experience of BSNL, there are about thirteen cable manufacturing companies in India out of which the MP Birla Group and a few others contribute more than 50% of the production. So obviously, other cable manufacturers will also have to upgrade their manufacturing capacity.

To summarize, bandwidth comes from broadband, broadband comes from optical fiber cable. Optical fiber cable systems with all associated infrastructures as well as judicious use of wireless technologies is expected to make the government’s ambitious program of “Broadband for All” successful. With these words, I implore all participants to share in the exponential growth of the telecom infrastructure and its reach into the hinterlands of India.

I take this opportunity to welcome all you gentlemen who have travelled far and wide to be here today. Thank you again for choosing India as a venue for this prestigious conference. Thank you.