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Indian aspect on 4G : Difficulties in implementing 4G network in India

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ABSTRACT

: As we know Indian govt. has started implementing its plan to replace all the existing mobile networks with 4G network to achieve its social objectives of spreading literacy, financial inclusion, providing better health facilities etc to build a more technologically stronger nation, but it hasn't been as expected so far. This paper is an effort to describe the aspect of 4G in Indian scenario and to summarize various factors which are causing difficulties in implementing 4G in India. This paper will summarize the progress of 4G in India.

Introduction

India is a rare success story in telecom space where mobile networks have dared to infiltrate the rural landscapes where electricity, roads, railways, drinking water is yet to reach. A country of more than a billion people carries the pride of 76% teledensity. Even after two decades of existence, Indian wireless telephony is primarily driven by voice which contributes 90% of the revenue. Fierce competition and falling tariffs helped telecom operators to put mobile phones in the hands of poor from urban slums as well as rural hinterlands. Considering 2G revolution is not enough to achieve Indian government's social objectives of spreading literacy, financial inclusion, providing better health facilities etc.

In the draft of New Telecom Policy 2012, government has set an objective to provide affordable broadband on demand by 2015, to achieve 175 million broadband connections by 2017 and 600 million by 2020, at a minimum of 2 Mbps download speed and making available 100 Mbps on demand. In remote areas, broadband connections are provided mainly through copper, optic fibre and Digital Subscriber Line (DSL). Using wireless broadband alongside the wired network will reduce the installation costs significantly.

Broadband Wireless Access (BWA or more commonly called as 4G) auctions were completed in June 2010 with six private players and two state players winning 66 licenses in 22 circles, limiting three players per circle. Collectively the licensees shelled out Rs. 385 billion in total for 20 MHz slot in 2.3 GHz range for private players and 2.5 MHz for state players.

Apart from Bharti and Aircel, no other major telecom player participated in the 4G auction, primarily on account of stretched balance sheets after spending huge sums of money on 3G auctions. Other reasons might be the fear of cannibalization of 3G subscribers by 4G as it offers better speeds than former and the lack of clarity on development of 4G ecosystem. 3G spectrum was auctioned at a premium to 4G, attracting a price of Rs. 33.5 billion per MHz compared to Rs. 6.4 billion per MHz for 4G, calculated on pan India basis.

Indian Aspect on 4G

Technology Choice – Wi-Max versus LTE

Worldwide, for 4G, Wi-Max is more widely adopted technology than Long Term Evolution (LTE) having a user base almost four times that of the latter but the latter is growing much faster than the former. North America (Verizon and AT&T in US), Japan and China are the major drivers of LTE worldwide. North America accounts for more than 40% of LTE's global set up. In India, out of the eight entities who bagged 4G licenses, only BSNL and MTNL have opted for Wi-Max platform whereas private players have made their intentions clear to go for LTE. The difference between Wi-Max and LTE is not as stark as GSM and CDMA apart from being promoted by two different associations - Institute of Electrical and Electronics Engineers (IEEE) and 3rd Generation Partnership Project (3GPP) respectively. Wi-Max has capacity to accommodate voice which LTE doesn't allow but LTE allows better integration with 2G and 3G as compared to Wi-Max. Even in case of LTE, Indian companies have shown preference for LTE-Time Division Duplex (LTE-TDD) technology adopted primarily by Chinese players like China Mobile against LTE-Frequency Division Duplex (LTE-FDD) adopted by US and European countries. TDD is offered primarily in the above - 2 GHz spectrum range whereas FDD is offered in the sub-2 GHz spectrum. Absence of harmonization of spectrum and technologies leads to ecosystem issues as devices are not exactly compatible across the technologies. This may hamper the mass production of 4G-enabled handsets which is essential to make the devices affordable especially in emerging markets like India.

(Current situation of Indian Companies in 4G is listed here in Table)

Players	4G License Areas	Progress on Roll out
Reliance Infotel	Pan India - 22 Circles	Proposed roll out in 2012 but delayed couple of times. Have adopted LTE-TDD. Most probably partner with Network 18 for content.
Bharti Airtel	Kolkata, Karnataka, Maharashtra, Punjab	Has launched services in Kolkata and Bangalore (Karnataka). Has adopted LTE-TDD. Eying on Qualcomm's Mumbai and Delhi licenses. Partnered with ZTE for Kolkata, Huawei for Karnataka, Ericsson for Punjab and Nokia Siemens for Maharashtra.
Aircel	AP, TN, W. Bengal, Bihar, Orissa, Assam, N.E., J&K	Intends to start services in 2012. No specific plans disclosed yet.
Qualcomm	Mumbai, Delhi, Kerala, Haryana	Settled the dispute over licenses in March 2012. No specific plans disclosed yet.
Augere	Madhya Pradesh	Claims to be the first company to launch 4G in India on LTE-TDD. Has partnered with Ericsson.
Tikona	Gujarat, UP (E), UP (W), Rajasthan, HP	It already offers fixed broadband to households and corporate using WiFi technology. 4G roll out is in progress.
BSNL	20 Circles - All India except Mumbai and Delhi	Intends to surrender its BWA spectrum in some / all the 20 circles.
MTNL	Mumbai and Delhi	No specific plans disclosed yet.

Difficulties in implementing 4G in India–

Device support is lacking:

Unlike 2G and 3G where spectrum bands were fairly uniform across various countries resulting into mass production of handsets bringing down the handset prices, 4G is offered in different frequency bands in different countries. Around one third of 4G subscribers today, predominantly in the US, served by Verizon and AT&T, are on 700 MHz band whereas Europe uses 2.6 GHz band. China and Japan are using 2.5 GHz and 2.1 GHz respectively. All the private players in India have received 4G spectrum in 2.3 GHz whereas BSNL and MTNL have it in 2.5 GHz. This puts limitations on interoperability of 4G devices across regions with

different spectrum bands. This also leads to fragmented production of the devices (handsets, USB modems, tablets etc) leading to higher costs, at least at the beginning, until the OEMs come out with devices compatible with more 4G frequencies.

4G remains a data only service in India; VoIP is yet to arrive: 4G, unlike 3G, does not offer Voice-based services through mobile networks but as Voice-over-Internet-Protocol (VoIP). The main difference between normal telephony and internet telephony is that in normal telephony, circuit switching technology is used, whereas Internet Telephony is based on packet switching technology. In the developed markets like US and Sweden where 4G has been rolled out, it is offered as a data only package, integrated with 3G packages for voice. In short, a user who is logged on to a 4G network will be seamlessly transferred to a 3G network the moment he receives a voice call. Voice-over-LTE (VoLTE) is a new form of VoIP and is under trial phase in some of the countries. In India, not all the 4G service providers have the option to provide seamless 4G and 2G/3G service offering both data and voice services on the same handset as only Bharti, Aircel, BSNL and MTNL among 4G licensees have 2G/3G licenses. This could be possible in future if government accepts TRAI's recommendation to make the spectrum technology neutral allowing the operator to provide 2G, 3G or 4G services using the same spectrum. As there is no clarity whether VoIP will be allowed fully in India, currently 4G services are limited only for data related usage.

Bright Aspects for 4G in India

Trinity of Internet, Video and Television

India's success in wireless telephony has been predominantly restricted to voice due to various reasons like lower literacy levels (74% overall and 11% English), lower internet user-base (<10%), lower PC penetration (~4%), unavailability of local language data content, lower Average Revenue per User per month (ARPU <Rs. 100) for 2G telephony due to lower affordability. As 4G promises high speed broadband that too without voice, prima facie the potential market for 4G seems limited to 100 million internet users and another 15-20 million additional users from groups like gamers, tablet-users etc. As we go deep into the success of any technology, for most of them the market exploded once the initial barriers like cost, supply, user-friendly technology etc are crossed. A decade back, no one expected that there would be any scope for one more technology like CDMA in India assuming that the market was saturated with a teledensity of 10-15%. But once the barrier of affordability was smashed, the same technology made inroads capturing more than 30% of subscriber base at its peak. Lower internet penetration in India arises out of higher cost of ownership of PCs which requires an initial investment of Rs. 20,000 along with other issues like inconsistent power supply, space requirement of at least 4 sq. ft etc. The next best options like laptops are equally expensive and delicate to handle, leaving them for corporate class and post-graduate students from technical and management streams. Also the lack of local content on internet is one of the major grounds for under-penetration of internet in India. On the contrary, a low cost tablet which is customized with suitable applications (apps), probably with a language option to convert into regional languages, along with reasonably priced 4G connection is a formula for success for Indian markets. Unlike a PC or a laptop, tablets can be a lot cheaper starting from below Rs. 2,000 level if we go by pricing offered by Aakash tablet (though 4G enabled tablets might cost more due to lack of mass production). In that case, cost and portability will be the biggest advantages for most of the target user groups like students, salesmen, SMEs, etc. This demand is in addition to the existing internet subscribers which are potential targets for 4G offered via USB modems and wireless gateways. One never knows, 4G might be the technology that will make the demand for tablets explode in India.

In spite of this, the fact remains that data usage has never picked up in India like voice. Other utilities offered by a mobile phone like news updates, emails, chats, utility services like banking etc could not fascinate telecom subscribers in India to the extent that they are willing to pay a premium to experience them at faster speeds (like 3G's case). We believe that beyond voice communication the biggest motivator for Indian masses would be video or rather video-on-demand. TV Viewer ship in India is just below mobile penetration and is the most popular medium of entertainment. With the advent of 4G, coupled with a low cost tablet and localized video content can be a game-changer in the Indian telecom as well as entertainment industry. To some extent, video-on demand on a 4G enabled tablet partially overcomes the disadvantages like choice of content, privacy, inconsistent power supply which leads to interruptions in the TV programs etc. So it can be safely predicted that video will be the next best product to sell to Indian customers, after voice and it also generates enough traffic on the network to generate enough volumes for the operators. Doing a small extrapolation, there can also be a scope for 4G entering the living rooms of entertainment-hungry Indian households via a set top box. Out of the Rs. 300 billion TV industry in India, a small pie would mean a sustainable market for 4G players, as against selling pure data. A 4G enabled set-top box would allow Indian user to view video-on demand on his television besides the regular TV content. Some of the 4G licensees are going for tie ups with media companies to provide exclusive content to their 4G users. In the end, video looks to be the shortest, fastest and safest route to bring Indian subscribers closer to 4G. Next to videos, what can attract Indian subscribers more is gaming. Mobile Gaming industry in India is expected to reach Rs. 14 billion by 2014 from Rs.2.4 billion in 2010. With burgeoning young population, Indian youngsters will show a preference for group gaming, spending more time in gaming cafes or playing games in a group, maybe at homes. A 4G based mobile hotspot can offer a convenient tool to provide faster speed for gaming cafes as well as individuals in their homes. Literacy, Mobile and Internet Penetration in India Source: TRAI, Census, Industry and CARE Research.

4G will bring fruits of Cloud Computing to Indian SMEs :-

On the corporate side, around 26 million SMEs in India offer a huge potential market for 4G as most of the SMEs lack affordable high-speed Internet service (broadband) in India, particularly in Tier II and Tier III cities. This is one of the prominent reasons for lack of widespread adoption of e- commerce by local businesses. From travelling sales force to accounts sections using internet banking, 4G offers a promise for improvement in business at each level for an SME. As cloud computing gathers steam, SMEs can use IT infrastructure including hardware like servers and platforms like Customer Relationship Management modules on pay-as-you-use basis rather than owning the infrastructure. 4G offers the vital link at faster speeds and affordable rates that can connect the IT system of SMEs to the clouds of service provider. Indian cloud computing market is expected to reach $16 billion by 2020, according Nasscom and 4G will be the key for the growth of cloud computing as it has the capacity to carry the huge amount of data needed to be transferred from the clients end to the host server.

Stable growth prospects :-

lower operating costs support business model Unlike 2G that has stuck up in linear revenue growth implying additional revenue coming primarily with proportional increase in subscribers as ARPUs are stagnated, 4G has fairly non-linear model with prospects of higher profitability as ARPUs are expected to be a lot better than 2G. Also, the limited competition in the sector, as there are just 3 players in a circle today, will help in holding tariffs unlike 2G.

Millions of SMEs in India should potentially offer a stable and high volume market for 4G operators. On the cost front, operating costs of 4G network are comparatively lesser than those for 2G and 3G, as 4G is the most advanced technology. As 4G is IP based technology, BTS are believed to be cheaper than 3G and are more compact and robust as compared to 2G BTS. There are considerable amount of savings as this BTS can be used outdoor without air conditioning and consumes less power as compared to 2G and 3G BTS, bringing down the energy expenses which constitute nearly 30% of network operating costs.

Conclusion

Although there are various factors which are affecting the growth of 4G in India but like 3G, 4G will also be implemented well in India in upcoming years.

Once the initial requirements are implemented (though they may be very costly in beginning),then it'll become much convenient to use much better & faster services such as accessing the Internet anytime from anywhere, global roaming, and wider support for multimedia applications.

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