4G COMMUNICATION TECHNOLOGY-EVOLUTION AND IMPACT ON BUSINESS AND ECONOMY IN INDIA

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ABSTRACT

4G communication technology, now-a-days has become synonymous with high speed internet connectivity. India has taken a lot of time in having such high speed mobile technology after gradual evolution from 2G and 3G services. 2G was purely voice centric with minimal data speed, that too by virtue of GPRS and EDGE technology. On the other hand, 3G is a mixture of voice and data. This paper attempts to study evolution of 4G technology in India, its impact on usage pattern of mobile users and on mobile operators. It is found that adoption of 4G communication technology is going to provide a fillip to the wellbeing of population considerably due to its positive impact on economy and among all sections of society.

Keywords: 4G, ARPU, Tele density, NTP.

INTRODUCTION

In telecommunication sector, 4G stands for 4th generation cellular wireless standard and is considered as an able successor of 2G and 3G technology. As per ITU-R (International Telecommunication Union Radio communication sector) standard, 4G is expected to offer a peak speed of 100 Mbits/s for high mobility and 1Gbits/s for low mobility (such as pedestrian and stationary users). 4G has become analogous to high data speed. Voice and Short Messaging Services were the backbone of communication till a few years back. 4G revolutionized this existing ecosystem. Mobile communication is now highly data centric .With the advent of 4G services; Indian mobile market has witnessed drastic changes. The paper attempts to highlights step by step evolution of 4G advent in Indian market and traces its impacts.

LITERATURE REVIEW

A brief review of existing literature indicates that there is a strong impact of digitization and growth of internet on the economy and the society. Michael Minges in World development report (2016) based on "Exploring the relationship between Broadband and economic Growth" has concluded that GDP per capita growth is 2.7 to 3.9 percent higher after the introduction of broadband .The report has also highlighted that an increase of 10 per cent in broadband penetration would increase GDP per capita growth by 0.9 per cent to 1.5 per cent. Mrinalini Kaul and Purvi Mathur in paper "Impact of digitization on the Indian Economy and requirement of Financial literacy "has stressed that digitization has created new job opportunities, have led to innovation in various sectors and also led to the growth of the economy i.e. have helped in the GDP growth of the country. Butchi Babu Muvva, Rajkumar Maipaksana, and M. Narasimha Reddy in their paper "4G and its future impact :India Scenario" has highlighted that the factors that drive 3G to 4G will be services that offer better quality (e.g Video and sound),more sophistication in association of large quantity of information and improved personalization. Mckinsey & company in its report "Online and upcoming –The internet's impact on India" has highlighted that internet has helped to add value to the stakeholders. Entrepreneurs have devised creative business models to reach more customers. According to the same report, internet has enabled small enterprises to increase revenue, reduce cost and improve

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productivity, while large institutes use online channel to build scale.

OBJECTIVE AND METHODOLOGY

The objectives of paper are to study of evolution of 4G services in India and study its impact on various stakeholders in the economy including its socio economic benefits, impact of 4G on usage pattern of mobile users and study impact of 4G communication technology on mobile operators.

Exploratory method was adopted to attain the research objective. Various books, articles, working papers and websites were referred to gain and interpret responses of 4G services in India.

DISCUSSION

Back ground of Mobile Services in India

During the early 90s, the telecommunication segment in India experienced rapid changes due to economic liberalization. The Indian Telecom sector, which was completely owned and controlled by the Indian Government, opened its gates for private participation. In the early phase, it initialized the deregulation of Telecom Equipment Manufacturing Sector and then allowed private participation in Value Added Services (VAS), such as Paging. In 1994, the Government published National Telecom policy 1994 (NTP 1994). However, the real growth of Telecommunication never attained momentum due to several reasons like high licensing fees, strict Government control etc. Then, came the NTP 99- the National Telecom Policy 1999, that boosted the Telecommunication sector in India. There had been far reaching developments in Information Technology (IT), consumer's mobility and electronic media industries. Telecom sector which started as a monopoly sector was rejuvenated by entry of fresh and new Telecom players. Till 2000, there were only 2 players in the mobile sector, however in 2001, Government allowed Government operator BSNL/MTNL as the 3rd Telecom operator. The situation of Telecommunication in 1994, just after liberalization, was miserable. Indian Tele density, at about 0.8 percent, was far below than the world average of 10 percent.

Total telephone connections were 8 million with an equally long wait list of 2.5 million.

In the year 2001, mobile revolution was triggered in India. Demand shortfall of telephone connections got slowly met by the GSM operators. In the year 2001 due to various changes in policies like announcement of policy for additional license for basic and wireless services, reduction in license fees, allowing limited mobility to basic services and allocation of spectrum allotted to BSO and awarding of new licenses etc. Year 2002 & 2003 was the year of mobile boom.

The boom of mobile connections is large contributed due to the decline in entry fees for Telecom players, falling of tariff, allocation of unified license and entry of BSNL in Mobile segment.

3G Arena: India entered in 3G arena in December 2008 through launch of 3G services by MTNL in Delhi and later in Mumbai which was followed by 3G launch by BSNL in Feb 2009 in Chennai and Kolkata. Later 3G spectrum was allotted to private players through auction in during September 2010.

Introduction of 4G services in India

Airtel was the first company to have launched 4G services using TD-LTE technology in Kolkata in 2012.It was followed by the launch of 4G in Bangalore, Pune, Chandigarh, Mohali and Panchkula. Later, 4G services in India was launched by Aircel, Vodafone and RJIO. With entry of RJIO in 4G scene the market dynamics changed completely. Band 3 (1800MHz) (FD-LTE), Band 40 (2300MHz) (TD-LTE), Band 5 (850MHz) are primarily used for 4G coverage in India.

Gaps filled by 4G communication technology

Flexibility, Efficiency and Secured Network: 4G has filled in the gaps of 3G in terms of flexibility, efficiency, scalability and security to support interfacing with

different types of networks and several new and existing services.3G had a huge limitation of upload and download speed. Maximum download speed of 3G is 21 Mbps while upload speed is 5 Mbps, while in 4G maximum download speed is 1 Gbps and upload of 500 Mbps.4G has replaced the cell based network of 3G with hybrid network.

Scalability: The core architecture of present mobile networks does have scalability issue to cope with future traffic demands due to its high centralized network. 4G network by virtue of its decentralized architecture provides a sustainable approach to deal with ever growing amount of mobile data traffic.

Higher bandwidth, huge network capacity along with reduced latency: Compared to 3G, 4G LTE delivers higher bandwidth, huge network capacity along with reduced latency, which results in faster network response and more efficient communication .The factors that drives towards 4G are services that offer better service quality (e.g. video and sound), more sophisticated volume of information, and more personalized approach.

Benefits of 4G communication technology

4G in Business Sector

Mobile workforces of an organization are increasing now-a-days. 4G plays a significant role in increasing the accessibility of enterprise-level applications. Faster real-time file sharing, media streaming, and communication between employees has become a reality with the advent of 4G. 4G improves workforce productivity, employee motivation and management effectiveness. In the presence of 4G technology, few of the benefits gained by organizations are: Large file transfer, Rapid work place setup, Sophisticated Machine to Machine Interaction and Remote Monitoring Applications, Video Conference, Live Media Collaboration, Remote Access etc. 4G, in real sense is contributing significantly by virtue of sheer mobility and flexibility with true broadband speeds and enhanced security.

4G in Social Sector

4G has been a blessing for various sectors such as telecommunication, healthcare, education etc. Telecommunication Sector has been benefited in many ways like growth of new markets with equally new demands. Healthcare sector is boosted in terms of online diagnosis; online consultation of Specialized Doctors, faster and secured patient background access. Two-way video on a 4G platform enables rural patients to consult Remote Specialists and saves time and energy of urban patients as well. Telemedicine actually materialized thanks to 4G. Several organizations have significantly reduced their costing as instant access of various details; updates etc have been available online and on real time basis. Educational Institution have now got a wider spectrum to use for Video conferencing with other schools/colleges, online guest lectures, Infrastructure tracking, Online tutoring, etc. New Industries are emerging with escalation in demand for new products and services, which in turn opens avenues for new enterprises and competition.

Entertainment Industry

Entertainment industry in India that produces the highest number of movies compared to any other country in the world is badly crippled due to rampant piracy. This brings limited revenues from genuine producers. 4G is capable of restricting this by the use of Digital Signatures, rights and copyrights. Correct guidance in this direction and awareness can revolutionize the viewing patterns of a common man.

Financial Services Industry

4G has accelerated in proliferation of active mobile banking in India with a better way achieved by using encrypted and image-based data. It has created a myriad of opportunities in India's financial services Industry, be it the local grocery store, Paytm or International Gateways.

Education, Skill Development and Training

India is a Youth Centric Country and its youth population has a huge hunger for

Education, Skill Development and Training. With affordable mobile high quality video, the access to non-classroom-based courses finds a huge platform to grow dramatically in India. These could benefit not only the rural population but it can also cause a paradigm shift for legacy players such as Public and Private Universities.

E-commerce

Indian E-commerce industry is growing at Exponential Rates. Online stores like Flipkart, Amazon, Alibaba and Venture Capitalists have invested billions into Indian E-Commerce. Many B2C and B2B E-commerce transactions are now happening over the Internet which was previously not even dreamt of. Startups, and fast moving incumbents from anywhere in the world can harvest rich reaps using this unique "4G- storm".

Not only business transactions, nowadays we find that many firms have shifted their Advertising Budgets from TV and Newspapers towards Internet and Mobiles. All of us have experienced Advertisements in the middle of a YouTube channel and even for scoring brownie points in a Mobile Game.

M-commerce

Thanks to the overall growth and development of 4G devices, M-commerce has evolved as a byproduct of E-Commerce. Online purchase apps that can be operated from our handsets have brought the store in the pocket of a layman.

As Internet browsing becomes cheaper and more accessible, even the rural population is getting advantage of this vast expansion. With 4G services, millions of subscribers are benefitted in terms of Government schemes and services.

M Governance

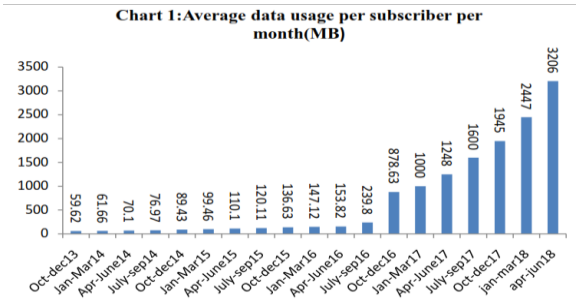
M Governance is a subset of e-governance.

G2C- Government to Citizen and G2B- Government to Businesses are upcoming domains of Governance. Mobile phones are also considered to be an effective tool in strengthening democracy through better citizen-government interaction, thus influencing the political decision making process and making governments accountable for their activities. With the advent of high speed internet in the form of 4G services, nine pillars of digital India has got a huge impetus. Delivering timely and accurate information to citizens is one of the keys to strengthen democracy and growth of citizen empowerment.

Impact of 4G on mobile ecosystem

Transition from Voice to Data and increase in Data usage

Indian Mobile Industry, since its beginning has been a Voice Centric Industry as maximum revenue was obtained from it. 2004 onwards, data usage in terms of Internet access came to picture when GPRS/EDGE service as an upgrade to GSM was offered to the subscriber. The growth of data in the initial years was very slow. However, with the advent of the Smart phones, new and faster Internet Technology and increasing dominance of social networking sites, data usage observed an upward Trend coupled with the advent of 4G and entry of major private player like RJIO.



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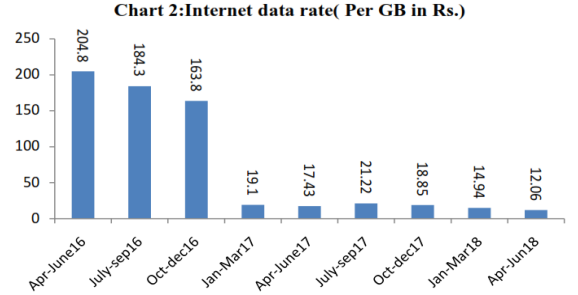
Reduction of cost of Mobile Data

With the launch of 4G and entry of new 4G player RJIO, the data access rates per GB wireless data reduced drastically.



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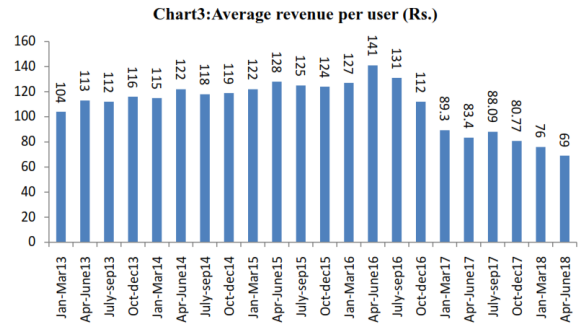
Reduction in ARPU

Wireless data boom also had a significant bearing on the Telecom Service Providers. Average Revenue Per User (ARPU) fell drastically thus affecting the Revenue of the Telecom Service Provider. Predatory Pricing played a very significant role in this.



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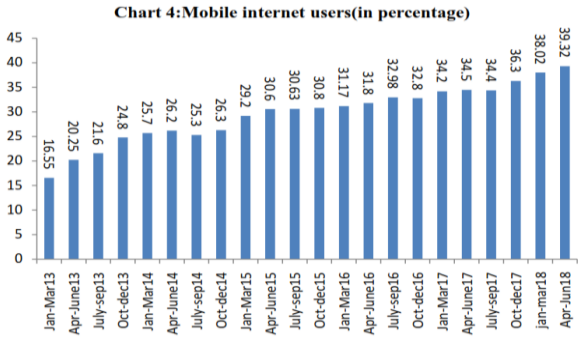
Significant increase in Mobile Internet users

The biggest gain of proliferation of 4G in India is definitely has been a significant increase of mobile internet users.



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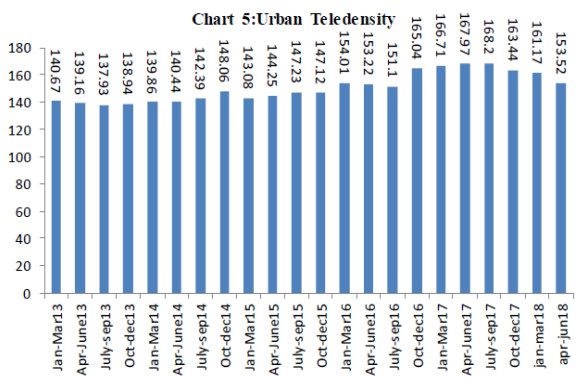
Increase in Tele density

With the proliferation 4G services led by RJIO, teledensity of rural and urban India has increased on a war footing.

Urban Tele density of India



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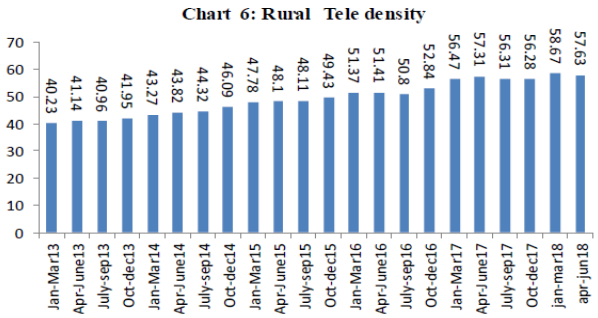
Rural Tele density of India



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Increased consumption of Online Contents

India saw an Exponential rise in the consumption of online content with the availability of free data. RJIO claims India's data consumption went from 20 rore GB to 120 crore GB in six months, adding that the average consumer nowadays uses 10GB data per month.

Free Voice calls

Voice calls became free for all consumers across networks when RJio launched operations. The company added that both local and STD calls will always be free on its network, to all networks. Rivals eventually followed suit, offering prepaid and postpaid packs with bundled free minutes for STD and local voice calls to all networks.

Growth of 4G Smart phones

The market for 4G smart phones exploded after RJio services were launched as everyone had access to the company's 4G network for free. While 4G handsets were seeing some traction in the affordable segment since late 2015, post-RJio, 4G VoLTE-capable smart phones started hitting the market for as low as Rs. 2,999. In fact, 95 percent of the smart phones sold in the country in the first quarter were 4G-capable, according to data by IDC and Morgan Stanley Research.

Consolidation of Telecom Market

India has seen some huge merger, acquisition in Telecom domain after the advent of 4G. Vodafone and Idea merged to reduce operating expenses and create

synergy, Bharti Airtel acquired Telenor ASA's India Business , Bharti Airtel acquired TATA group's consumer mobility business, Bharti Airtel acquired rights to use spectrum of Videocon, Airtel bought Tikona digital network's 4G business, Airtel acquired Augere wireless, Cash less deal was done by RCOM with MTS, Airtel purchased right to use 2300 MHz spectrum from Aircel, RJIO purchased spectrum, mobile tower, fiber and media convergence nodes from RCOM.

Limitations

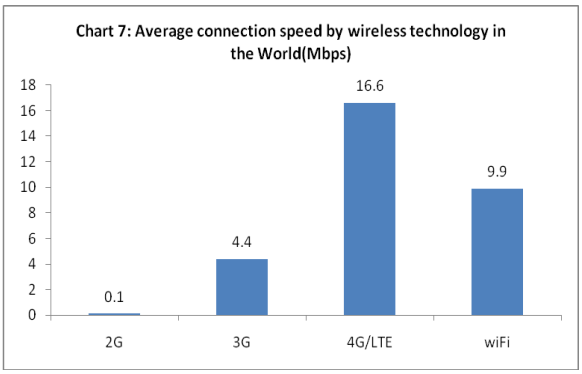
4G services although, it has grown by leaps and bounds in India but the rich benefits are yet to be enjoyed by citizen across all demographic strata. Rural internet users are still significantly less than urban internet users and there is acute internet divide between urban and rural area.

Table 1: Rural internet use Vs Urban internet user (in Per cent)

	Rural Internet user	Urban Internet user
Oct-Dec14	23.1	30.6
Jan-Mar15	26.7	33.0
Apr-Jun15	27.1	35.1
Jul-Sep15	26.3	35.6
Oct-Dec15	25.7	36.5
Jan-Mar16	24.9	37.8
Apr-Jun16	25.2	38.8
Jul-Sep16	26.6	39.7
Oct-Dec16	24.6	40.5
Jan-Mar17	27.2	45.3
Apr-Jun17	26.9	41.9
Jul-Sep17	28.8	48.0
Oct-Dec17	26.3	45.6
Jan-Mar18	27.8	51.1
Apr-Jun18	33.6	51.8

Source: https://www.trai.gov.in

A true comparison of 4G speed in India with other countries will suggest that we are still lacking far behind in terms of 4G speed. According to a list prepared by mobile analytics company open signal, on an average, the 4G speed in India has been measured at 6 Mbps ,which far behind world average of 16.6 Mbps.



Source:
https://opensignal.com/reports/2017/11/state-of-lte

CONCLUSION

4G although has surely been a blessing for India. It has given a major and huge fillip to digital economy in India. With the advent of high speed internet in the form of 4G services, major components of digital economy like E-commerce, digital payment, use of IT/ITeS are on a roll. Benefits of E-governance are on the finger tip. On the other side, with cut throat competition and higher operating expenses financial health of the telecom operators had a significant beating. In spite of this fact, 4G has been expanding at a rapid pace across the country, and networks are being upgraded from slower 2G services. We are now looking at 5G, the sophisticated and far advance version of 4G. key aim of 5G will be to improve Quality of Service further and extend the horizon of services like IOT(Internet of things) over a broader geographic area. In a nut shell, 4G has really impacted India's socio economic fabric in a positive manner for betterment of its population.

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