THE STATE OF 4G IN INDIA

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Abstract: **This article gives you an overview of current state of 4G LTE in India at present. This is an effort to illustrate how 4G LTE in India is behind the 4G LTE technology that the other countries have in place. Even though there are multiple carriers in India who are offering 4G connection at present we have a very deeply penetrated but pathetic and lethargic speed for almost every 4G connection. The need for 4G connection in India has reached sky high, thanks to Reliance JIO, but this has also been a great example to demonstrate that 4G connection is unreliable and slow in India. So, we take this article as our opportunity to spread out information regarding the current state of 4G in India.**

Keywords: **coverage issue, infrastructure of network, LTE, OpenSignal, JIO.**

I.   INTRODUCTION

The OpenSignal's latest "The State of LTE" report for June 2017 is out, and like most things in the Indian telecom industry over the past ten months, it is all about Reliance Jio. According to the report, 4G availability and coverage in India have shot up over the past six months. However, this has come at the already poor 4G network quality and the average 4G speed in India.

4G availability in India has now reached to 81.56% of the time, placing India at 15th place out of the 75 countries surveyed. This represents a considerable improvement over November 2016, when 4G availability was much lower at 71.60%, placing India at the 24th spot. However, this improvement has come at a steep cost – speed. The data indicates that the average 4G speed in India has come down to 5.14 Mbps, from 6.39 Mbps in November last year. This puts India at the pitiable rank of 74 out of 75. This is even worse than six months ago when India came in at 73rd.

A while back we reported the tremendous effect Reliance Jio has had on the 4G connectivity in India. They ushered in the 4G revolution in India and triggered a price war in the industry. Prices and data limits came crashing down and heralded a new telecom revolution in India. As a result, Jio managed to garner 100 million subscribers in merely six months! However, this new data points to a troubling trend that is showing no signs of improving. We pointed out how Reliance Jio's modus operandi was quantity over quality, and this has been a crippling factor in the industry too. The average 4G speed in India now clocks at 5.14 Mbps, nowhere near the global average of 16.2 Mbps. While countries like Singapore and South Korea are threatening to break the 50 Mbps barrier with average 4G speeds of over 45 Mbps, India is still stuck at just over one-tenth of that.

When compared to 3G, 4G offers greater bandwidth at a lower latency, with downloads quoted in the vicinity of 45Mbps. However, receiving those speeds is entirely reliant on network connectivity and congestion, which was a major issue during the 3G rollout. Carriers often saw a high amount of congestion on their networks, which meant that most customers never saw the claimed download speeds. This time around, carriers are looking to mitigate the issue of congestion by investing heavily in infrastructure. That said, there's still no guarantee that you'll actually see the claimed download seeds. For instance, although Airtel offers 4G in Hyderabad, the bandwidth is only marginally higher than what you get on 3G.

Indian carriers are leveraging both TDD-LTE and FDD-LTE standards to offer 4G connectivity in the country. The government auctions spectrum to the carriers for a duration of twenty years, with the most recent auction netting over $16 billion in revenue. The government was slated to offer up huge chunks of the 700MHz frequency in an auction last year,

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but there were no takers. Low-frequency bands offer a wider range and are unaffected by buildings, whereas higher frequency bands such as 2300MHz can transfer more bandwidth over a smaller area.

Band 3 (1800MHz) is primarily used for 4G coverage in India, as the spectrum was already in use during the 2G era. Carriers that offer 4G on Band 3 include Aircel, Airtel, Idea, Reliance Communications, Reliance Jio, Telenor, Vodafone, and Videocon.

Band 40 (2300MHz) is the second frequency on which carriers offer 4G connectivity. The government had auctioned airwaves in this spectrum to Aircel, Airtel, Reliance Jio, and Tikona in 2010. Reliance's pan-India network primarily relies on the 2300MHz frequency for cellular coverage.

Band 5 (850MHz) will be used by Reliance Jio and Reliance Communications in ten circles. If you're interested in purchasing a handset to access 4G connectivity, make sure the phone supports Bands 3, 5, and 40.

II. OPENSIGNAL'S ANALYSIS REPORT STATEMENT

"In OpenSignal's last India report we documented the intense battle for 4G dominance between incumbent Bharti Airtel and upstart Reliance Jio. Well, that battle still rages, but there's a new twist. In the past six months, Jio's 4G speeds have risen dramatically, coinciding perfectly with the end of its free-data bonanza in March. Though Airtel still took our 3G and 4G speed awards, Jio's superior 4G availability drove it to the top of our overall speed rankings. In short, Jio may not have had the fastest LTE speeds, but it delivered the fastest overall mobile data experience, according to our data.

In our second State of the Mobile Network: India report we analysed more than 7 billion measurements collected from 708,504 mobile devices from subscribers across India. We examined the 3G and 4G consumer experience on six operator's networks. Three of those providers — Bharti Airtel, Idea Cellular and Vodafone — operate both 3G and 4G networks. Two, BSNL Mobile and Reliance Communications, solely operate 3G networks. The final operator, Reliance Jio, is a 4G-only provider. Though India has many more operators, the country's complex regulatory environment means that each provider is licensed to operate in a particular set of regions, known as telecom circles. We chose these six operators as they all offer 3G and/or 4G services in a majority of those circles, making them the ideal candidates for our nationwide analysis.

In addition to our national rankings, OpenSignal has again turned the spotlight on specific telecom circles to see how these operators' 4G services stack up on a regional level. In our last report, we examined four of India's most economically significant regions, but for this analysis we're expanding our scope. In addition to metro circles Delhi, Mumbai and Kolkata and major regions like Tamil Nadu and Karnataka, we're seeing how the operators fair in three mid-sized circles: Haryana, Kerala and Madhya Pradesh. We feel this sampling will provide a more complete picture of how India's rapidly growing 4G market looks in different parts of this vast country. "

III. MODULE SPECIFICATION

A. *Reasons for "Why 4G is slow in India?"*

1. Coverage Issues:

The speed of the internet is directly proportional to signal coverage. In India, none of the telecom operators like Airtel, Vodafone, Idea or Jio can fix the issue. And now with the penetration of Jio into telecom, has changed the strategy of pricing which in turns affected the speeds.

2. Number of users in each location:

As the number of users increases in a location the amount of stress/hits made to a service tower also increase. And as discussed earlier, with the introduction of JIO the number of 4G users in India has shot up and this has made other carriers also to decrease their price. Because of this number of users in each location is increasing at a very high pace day by day.

3. The spectrum to which mobile phone is latched to tower:

The spectrums 850, 1800, 2300 and 2500 play a major role in defining the speed of data flow. The spectrum in use determines the connection quality and speed.

4. The infrastructure of the network:

The infrastructure used to build the network also has an important role to play. If optical fibres is used instead of copper wires or wireless connection, that area will have very good network reception when compared to those areas which have copper wires or wireless connection medium. Internet is different in India from what it is in the US, where 60 per cent have fixed lines, all converted into ADSL, DSL and FTTH (fibre-to-the-home) so they give very fast internet speeds. Besides, 50-60 per cent homes use the cable TV network, which is also used to deliver broadband. And wired broadband is always a better option. In India, only 20 million have fixed telephone lines and that too is going away slowly. Also, its quality is quite bad and it is copper and cannot take high speeds.

5. Low density of people who want high speed internet at a specific location.

6. Most people who have internet is okay with slow internet and is unwilling to pay more money as they only use it occasionally for email etc.

7. It is not profitable for ISPs to lay fibre optic cables to homes as people are unwilling to move to better internet plans. The investment to profit ratio is low.

8. Majority of the users who want high speed internet are students or the youth who have less disposable money.

B. Stats to show that state of 4G in India

The average 4G speed in India is marginally faster than the average global 3G speed of 4.4 Mbps. This is a startling fact, which points to the degrading quality of India's network infrastructure. Essentially, it is 4G in name only, with performance being functionally similar to 3G with poor latency and speeds. Just like Jio is primarily responsible for a lot of good that has happened in the industry, it is now also responsible for this huge negative.

There is still hope for the future. Jio's I&G (Infill & Growth) project in collaboration with Samsung aims to overhaul its entire network infrastructure and improve network quality. Reliance's network has also been under tremendous amount of stress in the past six months, owing to its free new year's offer. As Jio fully transitions to a paid subscription model, stress on the network should reduce, leading to improved speeds.

India had 86.77 million 4G subscribers in 2016, the latest statistics released by telecom regular TRAI on July 3, 2017 indicates.

The year 2016 marked the year of 4G launches. Reliance Jio Infocom, Bharti Airtel, Vodafone and Idea Cellular were active in the Indian 4G market last year.

Reliance Jio claims it had 72.16 million 4G subscribers, which were added during the promotion campaign in 2016. The TRAI chart indicates that Airtel, Idea Cellular and Vodafone had 14 million 4G subscribers on their LTE networks in 2016.

Total number of internet subscribers increased from 331.66 million to 391.50 million with yearly growth rate of 18.04 percent.

Wired Internet subscribers increased from 19.98 million to 21.51 million with yearly growth of 7.65 percent.

Wireless Internet subscribers increased from 311.68 million to 370 million with yearly growth rate of 18.71 percent.

Number of broadband subscribers increased from 136.53 million to 236.09 million.

The number of narrowband subscribers declined from 195.13 million to 155.41 million.

TRAI said the top five service areas in terms of internet subscriptions (wired + wireless) are Maharashtra (32.6 million), Tamil Nadu including Chennai (30.72 million), Andhra Pradesh (30.15 million), U.P. (E) (25.74 million) and Karnataka (25.48 million).

Bharti Airtel holds 22.38 percent market share in wireless internet segment with 82.79 million subscribers followed by Reliance Jio (72.16 million) internet subscribers .

BSNL holds 61.13 percent market share in wired internet segment with 13.15 million subscribers, followed by Bharti with 2.04 million subscribers. Total number of wired internet subscriber is 21.51 million.
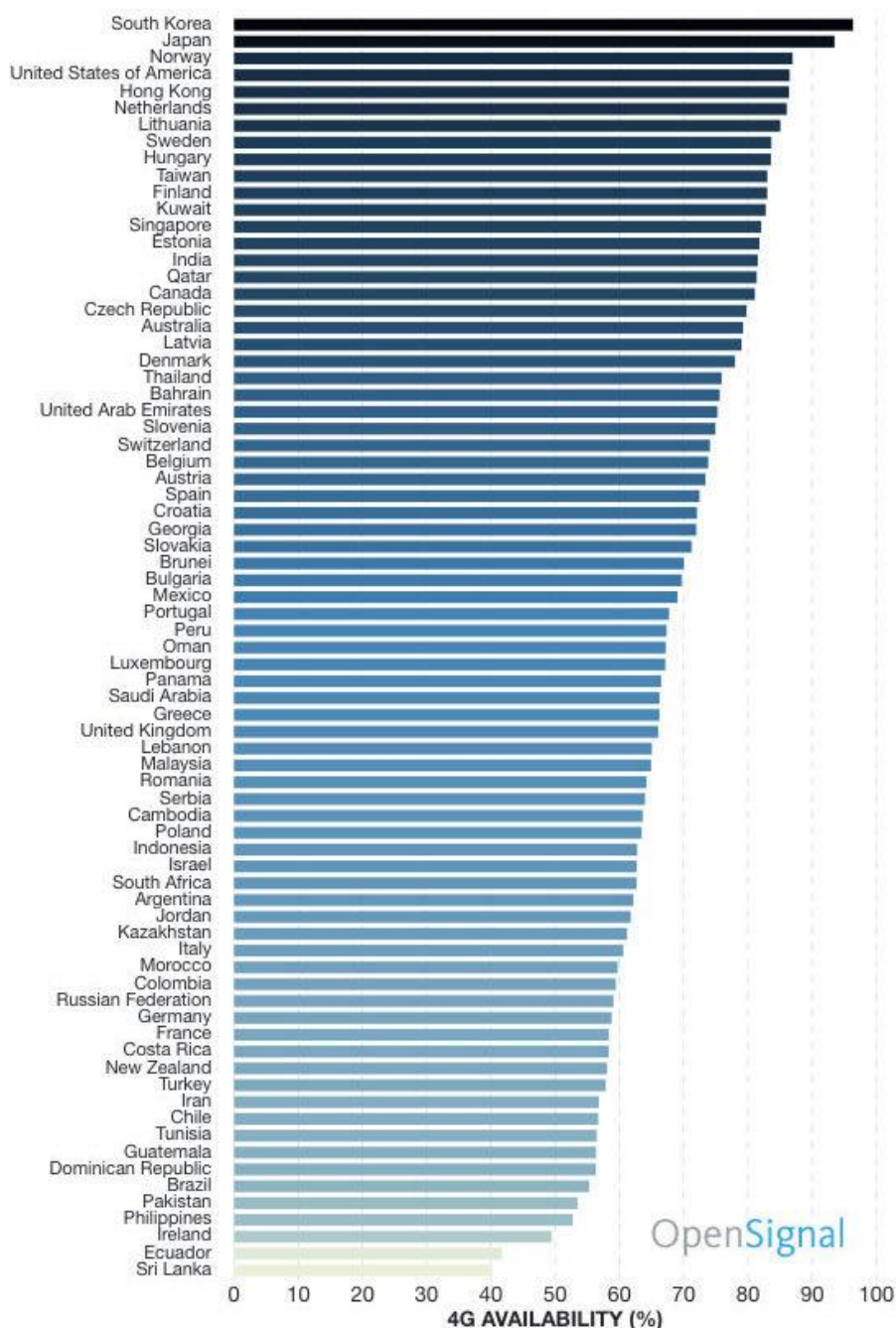
Figure 1

C. Bunch of questions answered:

1. Why haven't we allowed cable internet?

We have not been able to leverage the 100 million cable TV homes in India to deliver broadband, which would have given us very fast internet. TRAI has made recommendations to the government to enable internet on cable TV network. It has not been enabled because for providing broadband you have to take an Internet Service Provider (ISP) licence and there is a seven per cent Adjusted Gross Revenue (AGR) share with the government. The cable TV sector today does not share any revenue with the government. The government is worried that loss in revenue realisation will take place as the cable TV sector will not report broadband revenues.

2. Where exactly is the hitch?

Twice we have recommended allowing cable TV internet and asked the government to resolve the revenue issues. If the government forgoes the revenue share, it can make up from service- and other taxes. We have asked the government to treat wireless and wired internet differently.

3. Why has the government not promoted wired internet if that can give fast speed?

TRAI has been recommending the promotion of wired internet because it does not burden the spectrum. But, unfortunately, there is no fixed line and cable is not allowed in India. We have low internet penetration—350 million internet users with 512 kbps. If we increase speed to 1 mbps, the numbers will drop. Wireless cannot provide robust bandwidth.

4. What problems does wireless internet face?

There are too many rules and a lot of pressure on spectrum. And there are also issues with the towers.

5. So, what should the government do?

The government should treat wired and wireless differently, and FTTH should be the ultimate policy for providing broadband in India. We have also asked for the promotion of WIFI hotspots connected to wired broadband. The last mile is not using lic-ensed spectrum and that is a big solution.

6. What about satellite internet?

Satellite internet has high infrastructure costs and high recurring costs. And even then, the bandwidth you get is not much. It is only good for difficult-to-access areas and is not a solution elsewhere.

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IV. CONCLUSION

There are too many users using the same bandwidth which leads to over flooding of networks. Poor average network coverage due to diversity of different state and different climate conditions. The band width for the network has to be changed considering the present usage of internet including a common man. Fibre optics can be a useful tool for providing high speed internet with less price. There are two technologies that have been submitted to the International Telecommunication Union (ITU) as viable 4G candidates: LTE and LTE Advanced. The standardized versions of these technologies are the closest we will get to "true 4G" as 4G was defined. If that isn't fast enough for you, 5G is coming soon. I believe that the 5G that is first released will be way faster and more reliable than 4G. If it is rolled out too soon, the resulting technology will probably not be "true 5G".

REFERENCES

[1] OpenSignal Reports

[2] https://www.Quora.com

[3] https://www.firstpost.com/tech/news-analysis/india-has-among-the-top-4g-lte-coverage-but-among-the-slowest-download-speeds-in-the-world-4256183.html

[4] https://gadgets.ndtv.com/telecom/news/opensignal-ranks-india-slowest-4g-speeds-for-february-2018-1814896

[5] https://techbee.in/4g-availability-in-india-network-coverage-city-state-wise-areas.html

[6] https://www.businesstoday.in/sectors/telecom/india-4g-speed-slowest-world-ranks-below-pakistan-sri-lanka-kazakhstan/story/271264.html

[7] https://timesofindia.indiatimes.com/business/india-business/4g-speed-in-india-slowest-in-world/articleshow/63021612.cms

[8] https://en.wikipedia.org/wiki/4G

[9] https://www.androidcentral.com/4g-india-everything-you-need-know

[10] https://telecom.economictimes.indiatimes.com/news/indian-telecom-operators-not-ready-for-mega-spectrum-auction-for-at-least-one-year-icra/60278141