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HOW INDIA'S DATA TRANSMISSION ARCHITECTURE SHOULD SHAPE UP

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Encouraging broadband and 5G services would be the best bet for an Indian market that seems to prefer width over quality

In the next few years, there will be 6 billion connected people, 30 billion devices and 50 billion machines online. Pandemic-related lockdowns have accelerated the need for more effective work-from-home and school-from-home solutions. These "from home" solutions are likely to evolve to "from anywhere" ones, linking nearly everyone using consumer broadband, mobile gaming and connected cars to business networks, planes, ships, emergency responders and farms.

Before we tackle the question of the future of internet in India, here is some background. When we speak about accessing content in our homes, we are really speaking about digital data making its way from somewhere to your device. That data then recombines to give you a movie, or a song or a game or a video link with your office. The two principal paths are a broadband/fixed line route or a mobile data route. The broadband comes to your home courtesy of a telecom or cable operator. The mobile data is thanks to the mobile telecom operator. According to Ookla, India ranks 132nd in the world (behind Pakistan and Bangladesh) with a download speed of 9.8 megabits per second (Mbps) for mobile data, and 71 in the world with average broadband speeds of 32.4 Mbps. Today, South Korea has the fastest average mobile data speed of about 88 Mbps. The bottleneck for greater speeds in India has been the capital cost (and resulting congestion) for mobile data and the limitation of the last-mile copper wire for broadband speeds. Unless homes are rewired with fiber-optic wires, broadband speeds are likely to be limited to about 50-60 Mbps. Cable-based systems do provide higher speeds today, but their external wiring makes them vulnerable to weather related events and frequent outages.

Elsewhere in the world, broadband services are already at speeds that are close to 1,000 Mbps or 1 Gigabit per second (Gps). One possible future path for broadband is being called "10G". 10G will deliver residential internet speeds of 10 Gps, 10 to 50 times faster than most services today. Its backbone will be multiple fiber-optic wires and technologies, using some innovations that will enable a single fiber to handle signals moving in both directions. 10G promises seamless hand-offs with wi-fi technologies so that people can move freely around cities without any quality deterioration. The future for mobile data is called 5G–the "G" here stands for generation. With 5G, signals run over new radio frequencies, requiring new network architecture and updating radios and other equipment on cell towers. Operators can choose a low-, medium- or high-band network, with a corresponding decrease in coverage and improvement in speeds. Indian telecom operators are likely to choose the low band network to start with, which means initial 5G speeds are likely only to be 20-30% better than 4G. Beyond broadband and mobile data, an emerging path is one that uses satellites in low-Earth orbits (LEO). Satellites with an orbiting distance lower than 2000km from earth are typically LEOs; most man-made objects in space are in LEO. Bharti Global recently partnered with the United Kingdom government to take a stake in OneWeb, a LEO-based communications firm. OneWeb will compete with Elon Musk's company called Starlink, which promises ubiquitous high-speed internet using LEOs. It seems rather likely that these technologies will work with each other. For instance, the back-haul of the 5G network is likely to be the broadband network and local 5G networks may swap between satellite or tower-based transmission.

For India, the issue of adjusted gross revenue (AGR) dues has paralysed the incumbent telecom operators and put most of their balance sheets into distress. Reliance Jio is the only operator not to have financial issues related to AGR, but they too will hit legacy technology issues when it comes to converting 4G to 5G. Even though the roll out of 5G should begin soon, it is likely to take many years, and the abysmal mobile data speeds combined with poor quality of service are unlikely to change materially for several years. Except during 2G, India has consistently compromised depth and quality in mobile telephony for width and mediocrity of service.

Given this unstable oligopoly of operators, in the foreseeable future, India will have no choice but to encourage both broadband and 5G based data. Unfortunately for India, the major players for both will likely be the duopoly of Reliance and Airtel. Only time will tell if the quality of data from LEO satellites will be able to compete. From an access point of view, low- and middle-income India will likely be able to afford only one service and hence will choose mobile data. Only the well-to-do would be able to afford both broadband and mobile data services, particularly as mobile prices reset in India from their absurdly low levels. New apartment buildings should be pre-wired for fiber (in the same way they were wired for cable and telephones in an earlier era). Despite the rhetoric on smart cities, the fiber grid in many cities remains incomplete and should be completed soon. The debate must be joined in the public domain so that more of us have a voice in the evolution of this vital industry.

P.S.: “I dream of a digital India where access to Information has no barrier", said Prime Minister Narendra Modi.

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