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November-December 2021

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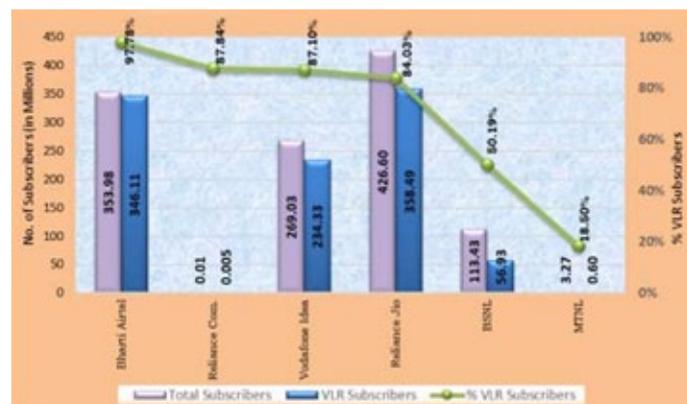
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**GAJENDRA  
UPADHYAY**

## [OPENING NOTE]

# In 2022 we are at the Cusp of a new Age in Communications in India and globally

The year 2021 was great for Weekend Lovers. It started on a Friday and ends on a Friday.

As the Work From Home (WFH) phenomena blurred the boundaries between work and play it also brought in new demand for High Speed Broadband. As the pandemic raged globally, workers logged in from their homes, villages, beaches and mountains. Both wireless and wired broadband became the lifeline.

The total number of subscribers continued to grow - according to TRAI's latest subscriber report released on 20th December 2021. It stood at 1189.62 million (wireless & Wireline) in October. By end December India should have crossed the 1.2 billion mark.

There is also hope of 5th Generation (5G) mobile networks going live in 2022. There is anticipation and high expectations from the latest constellations of Low Earth Orbit (LEO) satellite networks – OneWeb, Starlink and Project Kuiper from Amazon – promising to beam broadband into unconnected and unreachable areas of the earth.

This will be a second coming for Satellite Communications (Satcom).

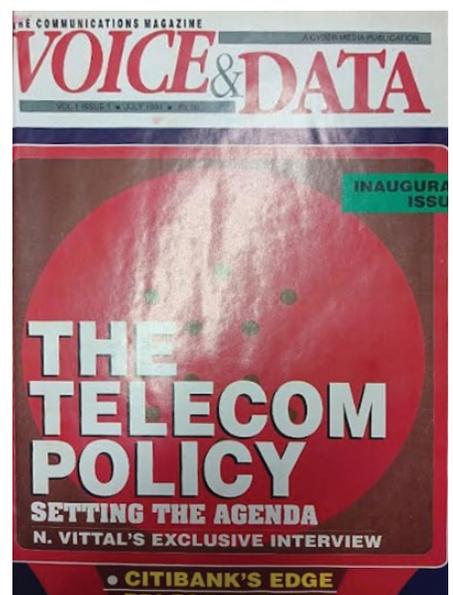
In the 1990s there were a flurry of LEO networks - Globalstar, Iridium, Odyssey, Teledesic being some prominent ones. But nearly all of them faded away due to high costs, low demand and not enough applications to justify global connectivity. Plus the end user devices were unaffordable.

The future seems to be here. Information Superhighways predicted in this last decade of the 20th century have become a reality – we work, entertain, sing, dance, heal, socialise and communicate on the Internet.

Satcom will help deliver the Internet faster and fuller to every corner – where ordinary networks do not reach.

In our New Year issue we will examine this in a little more detail. And hope to chronicle the beginning of the Satellite age like we did for the newly deregulated Telecommunications Industry in 1994 with the first National Telecom Policy that unleashed the revolution (the first Voice & Data Cover in the picture).

Wishing You a very Happy New Year.



[gajendrau@cybermedia.co.in](mailto:gajendrau@cybermedia.co.in)

# OPEN RAN - DÉJÀ VU TIME FOR THE 'FOREVER LIGHT BULB'

3G  
4G  
5G

Interoperability and better industry standards – that’s the premise and promise of Open RAN, apparently. But are we closer to solving cartelisation, over-engineering, customer pain-points and de-innovation? Or are we feeding these beasts with a new hand?

BY PRATIMA HARIGUNANI

It sounds impossible. But there is actually something called the world’s longest-lasting light bulb. It is in a Fire Department in Livermore, California. It is claimed to have been installed in 1901. It has been turned off only a handful of times.

But what sounds more incredible is the flip side of this marvel. If it is, indeed, possible for a bulb to stay chuffed and alight for years and years; then why don’t companies make one for the everyday customer? Well, that’s where we start talking about industry cartels. Like the Phoebus cartel. Where top industry players got together to test and apply standards so that bulbs did not exceed the permitted life of 1000 hours. But why did they not get together and make standards for extending the life and quality of a bulb?

After all, a good industry could do that and ‘should’ do that. Because as contradictory as it may sound, joining

hands can actually improve margins, enhance business and promote innovation.

Wait! Did someone cough – ‘yeah, on paper!’ ‘In your dreams!’

We have a good case on the table to find out whether it is idealism or realism. Open RAN is in progress. May be it will light up the world for Telcos and their end-customers. May be not.

Let’s see why.

#### **Inside the Bulb - What is RAN and why to ‘open’ it?**

RAN or Radio Access Network is what connects individual devices to other parts of a network through radio connections. It is a type of network infrastructure that wirelessly connects user equipment to a core network. It encompasses a baseband unit, radio unit or

They also enable Mobile Network Operators (MNOs) to adopt multi-vendor deployments and to customize their networks to suit their own unique needs.

remote radio unit, antennas, and software interfaces. The way it typically works is this - Data from a user gets to the network core after being received by a radio unit and is translated into a digital format by a baseband unit. So far different generations of mobile networks use different variations of RANs. That's where Open RAN steps in.

Simply put, Open RAN is a concept and an industry-wide endeavour (to some extent) for standards for RAN interfaces so that interoperation between vendors' equipment can be supported. The core drivers

are flexibility, multi-vendor choice, better visibility, disaggregation of hardware and software and open interfaces. It should also lead to an open space for new players and innovations to enter the market – and easily.

Wait - is there demand for Open RAN? Stefan Pongratz, VP and analyst for RAN and Telecom Capex, Dell'Oro Group, Inc. points out that 80 per cent of the top 20 wireless service providers in the world are investing, deploying, or exploring Open RAN. The drivers, he reckons, will vary depending on who we speak with. "But when it comes to the broader movement, one of

## Heading

- O-RAN standards enable a more competitive and vibrant RAN supplier ecosystem with faster innovation
- O-RAN-based mobile networks improve the efficiency of RAN deployments and operations
- O-RAN architecture is the foundation for building the virtualized RAN on open hardware and cloud, with embedded AI-powered radio control
- The architecture is based on standards defined by O-RAN ALLIANCE, which are fully supporting and complimentary to standards promoted by 3GPP and other industry standards organizations
- 33 new or updated O-RAN specifications released since March 2021 • First European Open Test and Integration Centers (OTIC) hosted by Deutsche Telekom and TIM
- The O-RAN ALLIANCE approved the first two European Open Test and Integration Centers (OTIC) : • European OTIC in Berlin hosted by Deutsche Telekom • European OTIC in Torino hosted by TIM
- OTICs will play an important role in managing the complex interoperability scenarios and related integration cost, and accelerate O-RAN product commercialization in large network solutions
- The O-RAN ALLIANCE is a world-wide community of 300 mobile operators, vendors, and research & academic institutions operating in the Radio Access Network (RAN) industry. Its mission is to re-shape the industry towards more intelligent, open, virtualized and fully interoperable mobile networks. It publishes new RAN specifications, releases open software for the RAN, and supports its members in integration and testing of their implementations.

Source: O-RAN Alliance

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“Open RAN describes a type of RAN deployment where interfaces within the RAN domain are opened or, in other words, where RAN elements from different companies can communicate with each other.”

**Rémy Pascal**, Principal Analyst, Mobile infrastructure, Omdia

the leading drivers from a carrier perspective is the degree of competition in the RAN market. Opening up the interface between the baseband and the radio should in theory, assuming everything else remains constant, reduce the staying power of the incumbents. While there are some early indicators that the ongoing efforts by the US government to curb the rise of Huawei is starting to show in the numbers outside of China, regulators, governments, and operators remain concerned about the competitive dynamics and the implications limited supply chain diversification can have on prices, innovation, and security.” And not all Open RAN is the same (many flavors of Open RAN), he reminds. “But operators are clearly warming up to the idea or the expectation that this interface will open up.”

John Baker, Senior Vice President, Business Development at Mavenir spells out the ‘need’ part on two specific areas. “Open RAN will enable vendor interoperability and vendor diversification. By opening the market and introducing competition amongst industry players, Open RAN sets up a rift between traditional incumbents, that have kept the market closed with proprietary interfaces, and forward-looking new entrants. Open RAN will likely force incumbent vendors to shift their business models away from hardware to a more software-centric approach, introducing new business and competitive risks through the transition.”

Interoperable interfaces allow smaller vendors to quickly introduce their own products and services, he explains. “They also enable Mobile Network Operators (MNOs) to adopt multi-vendor deployments and to customize their networks to suit their own unique needs. MNOs will be free to choose the products and technologies that they want to utilize in their networks, regardless of the vendor. As a result, MNOs will have the opportunity to build more robust and cost-effective networks leveraging innovation from multiple sources.”

This idea of an open space can help operators have interoperability for RAN elements with a white box approach to both hardware and software. It can liberate them from proprietary lock-ins and chaos. And the current RAN landscape can use a lot of this opening up. Because only a few RAN vendors offer equipment and software and most of it is totally proprietary.

The chief (or shall we say the most popular) effort in this direction is the O-RAN Alliance which aims for a well-documented architecture for open RAN interfaces and elements. It has been claimed that the new O-RAN standards will enable a more competitive and vibrant RAN supplier ecosystem. This will help faster innovation to improve user experience, while O-RAN based mobile networks can improve the efficiency of RAN deployments as well as operations by the mobile operators.

The word interoperability is all pixies, and rainbows and marshmallows to hear of. But is it really a common incentive for everyone in the industry to achieve it? Even if that’s possible, can we ever achieve true and on-ground/last-mile interoperability?

Rémy Pascal, Principal Analyst, Mobile infrastructure, Omdia points out that interoperability existed before open RAN, for example- interfaces between the user device and RAN and between the RAN and core were already opened and this is why, with rare exceptions, any smartphone from any manufacturer can connect to the network of an operator. “This is also why operators can select different RAN and core vendors or use multiple RAN vendors with a single core vendor.”

What is new here, he clarifies, is the improved interoperability within the RAN domain. “And compliance with the O-RAN Alliance front-haul interface, indeed, facilitates interoperability. But it is also worth mentioning that this can be implemented without, necessarily, complying with the O-RAN Alliance specifications. This can be achieved (though

It is important to test each component of the RAN in isolation for conformance to the standards and testing combinations of components for interoperability.

it's relatively rare) via a bilateral agreement between two vendors and interoperability work, generally at the request of their client, the operator."

Critics also say that this is nothing but just another close-knit huddle of like-minded industry players. Ask Remy Pascal, a Principal Analyst in the Service Provider Networks team, Omdia and who has more than 10 years of experience in the telecoms and ICT industries and he would break it down a bit. "There are several organizations involved in open RAN specifications and development including the 3GPP, the O-RAN Alliance, the Telecom Infra Project (TIP), the Small Cell Forum, the Open Networking Foundation (ONF) and probably others. 3GPP is the main mobile standards organization and its work covers the entire mobile system. The O-RAN Alliance develops additional specifications focusing on open RAN. The O-RAN Alliance specifications are intended to complement (not replace) the 3GPP standards," he reasons.

But was there a need or relevance for something like this. Did we not already have 3GPP and GSMA around? Pascal from Omdia argues that Open RAN is initially a service-provider (rather than vendors) led initiative that aims to create open interfaces, and the key driver is to give operators more freedom to choose suppliers of the various sub-systems / components of the RAN system. So operators, or at least some of them, felt there was such need.

According to the O-RAN alliance, some practical aspects are really being addressed. O-RAN claims that it conducts worldwide plug-fests to demonstrate the functionality as well as the multi-vendor interoperability of open network equipment. It also states that the O-RAN specification effort builds on common standards and cares about alignment with other industry bodies to ensure compatibility and to avoid duplication of work.

At the last count (Around June 17, 2021), the O-RAN ALLIANCE published another 33 specification documents, and these included - Management interface, timing and synchronization for Transport, the baseline for Non-Real-Time Radio Intelligent Controller (Non-RT RIC) and Near-Real-Time RIC Architecture and interfaces (E2, A1, F1/X2/Xn). It also covered certification

and badging guidelines and parts of end-to-end, interoperability and conformance testing.

Incidentally, Network Software Provider Mavenir and Vodafone have completed the first data and Voice over LTE (VoLTE) call across a containerised 4G small cell Open RAN solution in a lab environment. As per a press statement, it was revealed that the completed tests are the latest steps forward to delivering an open and vendor-interoperable 4G connectivity solution for small to medium-sized office locations. The plug-and-play small cell equipment can ensure comprehensive mobile coverage in every corner of the office, as explained.

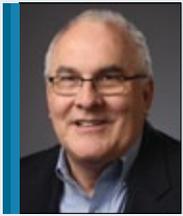
The two companies now intend to focus on finalising the packaging and automation of the solution before beginning trials with selected customers. As Andrea Dona, Chief Network Officer, Vodafone UK, said in the announcement; "Open RAN is opening doors to simplified and intuitive connectivity solutions. For our wider network deployment strategy, Open RAN is enabling us to work with a wider pool of suppliers and to avoid vendor lock-in scenarios that might prevent us from taking advantage of the latest innovations. The same could be said for enterprise connectivity solutions.

Stefano Cantarelli, Executive Vice President and Chief Marketing Officer, Mavenir, underlined Open vRAN as a very flexible architecture that can serve any type of segment and called this an opportunity to show that automated and AI controlled systems will simplify life to business and industry.

### A long way from the incandescent days

While progress and experiments are going on in full steam, there is another angle to this crusade. If we had stuck to the carbon materials as a bulb filament, no one would have innovated towards tungsten and LED. But why would any player do that when the industry fixed a 1000-hour standard?

Will the tenets of standardisation and interoperability not be tough to balance on a see-saw which also has competitive innovation and patents that industry players are investing in? Specially when these areas are gaining remarkable weight now?



“It is essential to determine both that the components conform to the appropriate standards in isolation and that they work together as a unit. Skipping the conformance testing step and performing only interoperability testing would be like an aircraft manufacturer building a plane from untested parts and then only checking to see if it flies.”

**John Baker**, Senior Vice President, Business Development at Mavenir

“This is an interesting question, but I don’t have a simple answer,” tells a candid Pascal. “Some argue that opening interfaces facilitate the entry of new vendors which, in turn, encourages more competition and not only price-based competition but also technology/innovation-based competition. Others will say that this model requires vendors, or at least a majority of them, to agree on supporting a specific feature for it to be added to the specifications, and if that’s not the case then this could block or slow down the introduction of new innovative features. So there are opposing forces.”

Pascal maintains that this does not mean, however, that innovation will not take place in other areas which are not covered by the specifications. “Another thing to keep in mind is that open RAN does not mean the end of proprietary technology. The software code remains the property of vendors and the O-RAN Alliance also has an IPR policy in place and its members can make their intellectual property available to others under licenses on fair, reasonable, and non-discriminatory (FRAND) terms, which is a common practice in this industry.”

As to achieving true and on-ground/last-mile interoperability, Pongratz from Dell’Oro Group argues. “If it is a must or want is a different question. The incumbent suppliers have done an astonishing job with the proprietary RAN architecture managing the asymmetry between data traffic growth and topline RAN revenue growth because at the end of the day – the RAN market has advanced at a 1 per cent CAGR between 2000 and 2020 while mobile data traffic has grown nearly 1000x. At the same time, we are still in the early days when it comes to blanketing society with connectivity and clearly some believe that the current market concentration could impact pricing and innovation in this next phase of this journey.”

True interoperability, as he poignantly underlines, will, of course, be challenging and take some time given

the sheer size of the installed base and the fact that the O-RAN spec is not part of 3GPP.

Baker from Mavenir avers that without complete and standardized interfaces, interoperability is impossible. “Testing is, therefore, essential to ensure compliance with standards. Simply cobbling together a few instruments and running a few tests is not an adequate solution. Testing each section individually to the maximum of its capabilities is critical. Choosing and implementing the right equipment for your network requires proper testing with the right tools, methodologies, and strategies. Therefore, it is important to test each component of the RAN in isolation for conformance to the standards and testing combinations of components for interoperability.”

Due to more sizable budgets and experience, established industry OEMs may maintain more advanced or mature Intellectual Property (IP). “While likely an accurate statement at this juncture, Open RAN’s open and extensive ecosystem can ultimately be expected to drive innovation across the ecosystem and create valuable IP.” He hopes.

### **Ikea Bulbs - Adding V to RAN**

Is it a coincidence that these ever-lasting bulbs are found in fire departments? IT has been the designated fire-fighter for businesses for a long time. And that’s why new fire-hoses like virtualisation can help in keeping these bulbs well-lit.

Virtual RAN (vRAN) describes a type of RAN implementation where RAN hardware and software are disaggregated, and it is possible to run some of the RAN functions on generic servers instead of purpose-built hardware, explains Rémy Pascal, Principal Analyst, Mobile infrastructure, Omdia. “And open vRAN describes a RAN implementation where both open RAN and vRAN principles are applied.”

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We have seen more architectural and technological advancements over the past three to five years than we did in the first 30 years rolling out 1G-3G.

Baker from Mavenir adds that the move to software-centric approach due to Open RAN is creating momentum for several industry-led open virtualized RAN initiatives that seek to unite an ecosystem of supply chain partners and advance open RAN through the definition, development, and testing of standards and reference architectures. Beyond the standards defined by 3GPP, multiple industry groups like Telecom Infrastructure Project, O-RAN Alliance, Open RAN Policy Coalition, Open Networking Foundation are leading the Open RAN movement, each with a different purpose.

When RAN uses Virtual RAN principles and technologies; it leads to easy automation, less network complexity, more network malleability, enhanced, and reduced capex and opex costs.

Really? That depends on a lot of other questions too.

### A Flickering Light – Hope or Stress

As to what challenges envelope this road now or ahead, the list is still in the making.

There is no shortage of challenges and opportunities when it comes to the RAN market. In the reckoning of Pongratz from Dell'Oro Group, one of the main points

of this picture is to show that the suppliers have to be extremely nimble to keep up with the pace of change. “We have seen more architectural and technological advancements over the past three to five years than we did in the first 30 years rolling out 1G-3G. So one of the reasons we are more optimistic about the world today than we were say in the 3G to 4G transition is simply the fact that there are so many more efforts taking place in parallel not only on the supply side but also on the demand side of things.” He also spells out the 5G context and future implications here. “Yes 5G and MBB are still extremely important and they drive the lion’s share of the market still but at the same time, 5G is only one piece of the puzzle. So at a high level, one of the key challenges going forward will be for both incumbents and suppliers with weaker footprints to figure how to optimize finite resources to maximize the likelihood of success with all the various opportunities.”

For Pascal from Omdia, the aspect about challenges is a broad question but assuming we focus on open RAN here, there is still some work to do in terms of specifications and standards - but they are maturing and continuously evolving which is the normal process in this industry, so not, necessarily, something to be too concerned about.





“Open RAN is often viewed as a magic architecture that will level the playing field and result in a changing supplier dynamics.”

**Stefan Pongratz**, VP and analyst for RAN and Telecom Capex,  
Dell'Oro Group, Inc

“Then, besides that, there are many other considerations for operators when they design/build/modernize their mobile networks. Aspects such as performance, energy efficiency, reliability, security, flexibility, cost and more also have to be taken into account.

Both the open model and the integrated model have pros and cons; there are trade-offs. Operators assess all these dimensions and then they select the solutions that best suit them.

Finally, it does not have to be black or white, operators can combine different approaches, models will co-exist.” Pascal augurs.

Plus, there are the other implications to get ready for. The imminent arrival of 5G, Edge Computing, private LTE, can translate into a lot of roadwork for Open RAN. Pascal from Omdia points out that 5G is already largely happening. “There were over 160 commercial 5G mobile networks around the World (as of June 21) and most of them are not open RAN compliant (Rakuten would be one exception), or only very partially. So 5G is effectively happening before open RAN. That being said, we also understand from our conversations with operators that they will increasingly mandate compliance to some or all principles of open RAN in the future (generally following the O-RAN Alliance set of specifications), so open RAN principles will increasingly influence procurement.” As for private networks, he feels that it is one of the use case that several operators are considering for open RAN.

Another angle worth pondering over before it is too late is this. How can these tenets of standardisation and interoperability be balanced with competitive innovation and patents that industry players are investing in. Baker from Mavenir argues that Open RAN does not tell you how to build the product, which can then be built in innovative and creative ways in both hardware, software or both. “A balanced framework for standardization and

interoperability is key to incentivize R&D and innovation and stimulate investments. The industry can set up teams and focus on innovation and engagements in Open RAN architecture, be it through opening up 3GPP interfaces, or utilising O-RAN Alliance or Small Cell Forum common and open interfaces.”

The Open RAN effort is, indeed, battling a lot of criticisms and doubts, every now and then. Apart from the worry of it being a fragmented effort, there are also shadows cast on its lack of transparency (the veto power and privilege of defining specifications that some big members apparently enjoy). Add to that the insistence that it should be pushed into the 3GPP for getting more representatives from about 200 countries and expanding the gamut of collaboration with even more vendors and contributors from academia and others. There is also confusion about whether Open RAN would decrease costs or increase the open burden for an operator.

And, course, if there are more vendors than one, how do we ensure water-tight security of the deployment, and how do customers find a precise throat to choke in case something conks off?

“The disaggregation of the RAN increases the number of individual elements and network connections. This has prompted concern from some that Open RAN could potentially be more insecure than its ‘closed’ predecessor due to a greater number of interfaces. In fact, Open RAN is more secure because you can test and see what is being delivered by third parties.” Baker from Mavenir confronts the security angle with a positive lens. But he is concerned about efficiency. “Running software-based virtualized Open RAN applications may not be as efficient as processing them on purpose-built hardware. Although this is indeed a legitimate concern, the ability of Open RAN components to scale, increase flexibility, and drive down costs through increased competition, innovation, and volume offset this limitation.”

These push telcos to expand network footprint to meet the needs of enterprise and residential consumers, but also to accelerate the adoption of Open RAN to evolve to 5G.

### Lights Out?

The purpose of something as ambitious, and disruptive, as this can be defeated if wide scale adoption and acceptance of these standards does not happen – or happens in a random or sporadic way.

The current geo-political dynamics have often put a pause button on such initiatives. It is important that players and members have fewer moments of inertia, walk-outs, disagreements and deadlocks.

In a recent September update though, the O-RAN ALLIANCE stated that it remains fully committed to its mission of delivering open, intelligent, virtualized and fully interoperable RAN. It explained that the O-RAN ALLIANCE became aware of concerns regarding some participants that may be subject to U.S. export regulations, and has been working with O-RAN participants to address these concerns.

According to a media statement, the O-RAN Board has approved changes to O-RAN participation documents and procedures. While it is up to each O-RAN participant to make their own evaluation of these changes, O-RAN said that it is optimistic that the changes will address the concerns and facilitate O-RAN's mission.

Titans of the industry manifested a positive thrust too. Andre Fuetsch, Chairman of the O-RAN ALLIANCE and Chief Technology Officer of AT&T said here that O-RAN is an open and collaborative global alliance operating in a way that promotes transparency and participation of our member companies in the development and adoption of global open specifications and standards. Similarly, Alex Jinsung Choi, Chief Operating Officer of the O-RAN ALLIANCE and SVP of Strategy and Technology Innovation, Deutsche Telekom added in the update, "We remain fully committed to working together in the alliance to achieve the goals and objectives of O-RAN as quickly as possible.

Open RAN is often viewed as a magic architecture that will level the playing field and result in a changing supplier dynamics, quips Pongratz from Dell'Oro Group as he hastens to remind us that the reality is that it is more of a first step to open the door. "But this architecture does not change the fact that the carriers

are operating in an environment with constrained topline growth and they ultimately need to optimize TCO/energy consumption/spectral efficiency and find partners that can help them tackle new opportunities while also supporting legacy networks."

The growing torrent of data traffic and resulting push to build 5G and edge services are driving wider virtualization and cloudification of wireless networks, adds Baker from Mavenir. "These push telcos to expand network footprint to meet the needs of enterprise and residential consumers, but also to accelerate the adoption of Open RAN to evolve to 5G. Over the next three years, Open RAN deployments will help create big new revenue opportunities for carriers and industry suppliers. For enterprises and consumers, this latest convergence of computing and communications will speed the delivery of transformative new services for everything from AI and IoT to autonomous vehicles, private mobile networks, and more. It's a key link in bringing cloud power to the mobile edge."

Well, amidst all the hope and hype, it is not enough to start something that adds a common denominator for the industry. It has to have life, traction and consistency.

The secret to the few long-lasting light bulbs still present in this world is not as much in their filaments but in their being 'switched on'. They have been seldom turned off, and experts tell that a lot of wear and tear in incandescent light bulbs happens by the constant turning-on and off they go through. Because its filament gets heated and cooled again and again. That makes the material of the filament expand and contract a lot and, hence, creates stress-cracks.

The filament has to break at some point and that means the light will burn out – when we switch it on and off again and again.

Whenever the industry gets together for a common cause of developing better, simpler and universal standards – it has to stay together. Else, it's a pointless huddle. Switching such efforts on and off again hurts the bulb. And the light. Inside and out. 🌟

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# Catalysing digital transformation with cloud for Banking

Banking can no longer be constricted by physical branches, legacy systems or segmented databases. Leveraging the cloud infrastructure will play a big role in this transformation.

BY KISHAN SUNDAR

**W**hile the cloud has emerged as a mainstream technology for the banking industry over the years, the pandemic of 2020 forced banks to expedite the cloud adoption and respond to a changing landscape with a new mix of business strategies – all with cloud computing at the heart of their execution.

Pushing the boundaries of new horizons has already begun. Capital markets and banking leaders are increasingly recognizing the importance of the cloud as more than a technology. They are realising that the cloud is more of a destination for financial services institutions to store data, applications, and advanced software applications, and can prepare them for the future. Nearly 80% of Indian corporate banks in fact, are forecasted by IDC to run all trade finance and treasury workloads on the cloud by 2024. Furthermore, in response to the pandemic's stress on liquidity, ~55% of corporate banks are projected to invest in supporting predictive liquidity management capabilities by 2024.

In this article therefore, I would like to explore some ways banking transformation is already taking place on the cloud across some key focus areas for cloud investments. Before that however, we will decode some traditional mind blocks when it comes to banking on the cloud.

## Unblocking mind blocks in adopting cloud for banking

The sceptics have not always been sure about the cloud, citing regulatory ambiguity, security concerns, the sensitive nature of the data a bank carries, etc. But the questions that have always plagued banking leaders the most, have been about how they can overcome the stumbling blocks of legacy infrastructure or the deeply coupled system which is running for ages.

For one, the monoliths are not only cumbersome and costly to maintain, but they also run on obsolete



technology with little to no updates. Secondly, legacy systems may have stood their ground through the technological storm, but they still aren't designed for the fast-moving nature of the digital age. Finally, the rigid organizational structure and siloed nature of traditional working form a huge barrier to innovation in banking. The shift to the cloud means more than migrating simply IT assets, and calls for an agile, future-ready, and resilient mindset.

Such a culture of innovation only comes through a thorough adoption of customer-centric, risk-averse, and change in attitude. Given the process is time-consuming and expensive, even the smallest misstep can result in service disruption and/or attract regulatory scrutiny.

At the end of the day, independently installed technologies over the years combined with the concerns about protecting both institutional and customer data

Energy storage technologies such as copper-foam and solid-state lithium-ion batteries will improve things, but both are at least five years from common availability.

have made banking leaders embed digital operations within their site, proceed cautiously, and slower than other technology-catalysed industries.

That said, this approach only works if the institution is not only well funded, but also can afford a large IT team of developers and programmers with adequate productivity and flexibility for storage and computing issues. While this traditional tactic can work for a few, and the short term, banking leaders are still left without the strategy to address the opportunities in next-gen cloud-based core banking systems.

### Banking on cloud for digital maturity

From digital identification with Aadhar, interoperable and open-API by UPI, video-KYC to revolutionary 'Digital India' initiatives, the regulatory ecosystem in India has ensured that customers are more engaged with digital means of financing.

Combine this with incumbent fintech firms expanding the reach of financial services in innovative, low-cost, cloud-first ways, the digital maturity in banking is steadily playing catch up due to the challenges of moving too fast. But the pandemic has changed all of that.

Due to lockdown restrictions and norms, banking is expected to no longer be constricted by physical branches, legacy systems, or segmented databases. Banking leaders can lay a critical role in leveraging the cloud to catalyse this transformation by investing in cloud for a few critical areas, some driving business frontiers externally, and some optimizing the organization within.

- **Syncing the enterprise:** Ensuring better integration of departments and business units through shared data to drive insights-driven and integrated decisions
- **Building resilient operations:** Enhancing the overall resilience of the bank to respond to disruptions quickly, as well as gain the ability to replicate data and services across regions with unified visibility.
- **Driving business innovation:** Innovating and driving strategies to improve customer experiences, create new market offerings, retain customers effectively

leveraging new technologies such as machine learning, automation, AI and more.

- **Enhancing IT security:** It is important to have a clear knowledge of how security varies on the cloud given the native tools to each cloud environment, and how the cloud provider takes care of security for low-level layers of the infrastructure.
- **Discovering new ways to work:** Aligning cloud strategy with business goals not only helps with process improvements and connectedness, it also brings in new ways of working, new talents for required skill sets as well as holistic agility in daily operations.
- **Flexibility in scaling computing costs:** Cloud not only helps pave the way for innovative technologies, but also helps move away from the heavy up-front capital spending required (Capex), towards an operational one (Opex).

### Cloud on every board's agenda

Cloud is a top agenda for every banking CIO. Axis Bank for example, has confirmed being on track to take 70% of its apps and infrastructure to the cloud within the next two years.

Yes Bank also continues to stress the importance of using cloud-native architecture and infrastructure to leverage new technologies such as Artificial Intelligence, Machine Learning for better operations and customer experiences. Or take The State Bank of India's strategy of scaling their SBI Card business, marketing, and HR ecosystem with cloud. The possibilities are endless.

After all, in a world with increased blurred boundaries – where Google's smart devices and platforms can deliver banking experience and ride-sharing apps can offer loans – banking is at a nexus of transformation. Not only must they ruthlessly determine goals while playing to their strengths, but they must also harness digital technologies to drive greater efficiency and be agile when faced with volatile market adversities. 🧩

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# “A Mouse That Eats Chalks. And then, they all say Cheese!”

*A social cause can gain so much from the right use of technology – speed, outreach, last-mile impact and empowerment. But what happens when the unique challenges of Indian’s geographical, as well as social, terrain come in the way of skilling India’s youth. How to handle tele-density issues, digital illiteracy and Kuznet’s graphs? Pratima H finds out here with Nishant Baghel, Director Technology Innovations, Pratham who oversees programmes that reach more than 5,00,000 children and have been recognised by the World Economic Forum as the only ‘School of Future’ from India.*

**An Economic Intelligence Unit (EIU) analysis indicated that for every 10 percent increase in school connectivity in a country, GDP per capita could increase by 1.1 percent. Does this work - in your observation and experience?**

Pratham works closely with the communities through direct community-based interventions, instead of connecting through schools. However, Pratham’s digital initiatives focus on connecting remote rural low-tech communities with access to digital tools and internet connectivity. The digital tools and the content are an effort to supplement what the children are learning in school. PraDigi Open Learning is cognisant of the rapid pace of digital transformation and technological advancements, hence ensuring accessibility to digital tools and infrastructure for communities has been the starting point.

**How do you assess the impact?**

Initially, the tablets sparked curiosity among the children since they did not always have access to even a mobile phone. They have voluntarily formed groups and over the years have not only learnt how to study through tablets, but also use cameras to film and edit videos. In fact, Pratham’s internal evaluation between 2017-18 has shown a nine per cent improvement in learning outcomes of school-based subjects such as Math, English and Science over a control group. Recognising the need to prepare the youth in the communities as well for technology-based employment opportunities, Pratham trained and encouraged them to be the custodians of the

Raspberry Pi which they could use to learn skills such as coding and access educational websites. The digital initiative of Pratham started only half a decade ago, hence an evaluation to see impact on the GDP is a long way to go.

**What is the role of technology in expanding reach, impact and the multiplier effect of your efforts?**

Technology has enabled access for the remotest of communities, and helped us ensure that efforts reach every last-mile learner. The COVID-19 pandemic only highlighted this need further. However, access to modern technology is still a questionable reality for the majority of the Indian population. The rural tele-density and wireless tele-density figures indicate the economic disparity between rural and urban communities. This disparity is further skewed with a clear gender bias—fewer females have access to phones or the internet than their male counterparts. This prompted us to explore ‘outdated’ technologies, such as SMS, Radio, TV, WhatsApp, in order to reach the remotest of communities. This was coupled with offline efforts, built in tandem with community involvement, to ensure the efforts reach even those that didn’t have access to the low-tech media.

**Can you explain with any specific examples?**

With the help of technology, we could work out of our homes across the country to create interventions that helped us reach the communities with the simple tap of a button. For instance, to optimise our education and partnership programmes, we relied on Salesforce Tableau. We created custom dashboards for stakeholders in the ecosystem—governments, teachers, and volunteers—that provided a holistic view of the education system, including enrolment rates and programme penetration. In addition, we leveraged Slack to stay in sync with team members spread across the country and collaborate on content creation and product management tasks.

**Is there any special contribution of technology for the cause you work for?**

PraDigi (Pratham’s digital initiatives) are built on three core pillars (social structure, content and



**Nishant Baghel**

Director Technology Innovations, Pratham

## [INTERVIEW]

### PRATHAM

digital infrastructure) and technology is one of them. Technology plays a critical role in fostering community connections, creating and delivering digital content and making remote learning accessible for all age groups. However, a key factor in the development of technology for education is content and its contextualisation based on the audience. With a stark digital divide, it is difficult to use a one-size-fits-all approach to reach all learners in a similar manner. However, with technological innovations, contextualisation, and adapting to change, it is possible to reach all learners.

#### **How crucial are IT skills to the portfolio of skills that you provide to the underprivileged?**

We have shifted to create and prove a curriculum solely focusing on digital readiness—making fundamental digital skills easy to learn remotely. PraDigi Open Learning, Pratham's hybrid learning initiative for over 5 years, uses technology as a basis to teach school, work and life-related skills to young learners in an interactive manner. Children not only enjoy the engaging mixed-media content, but also appreciate the access to technological skills that the intervention brings. Youthnet, PraDigi's digital vocational training program has a supplementary outcome—youth getting comfortable with virtual learning and digital tools such as WhatsApp, WorkPlace, Zoom, and other Android apps.

#### **You seemed to be already prepared with the brassstacks of digitisation even before the pandemic hit? How? Any challenges which you encountered during the crisis?**

Pratham's digital initiative, PraDigi Open Learning, had been running for about 5 years in rural communities of many states in India. When the pandemic hit, we were better prepared, because we had been investing in technology-enabled open offline learning environments. Through our experience and experiments over the years, we knew what kind of content would be effective and engaging for the learners.

We faced a few challenges and hurdles during the crisis. With the lack of access to technology in the community, we had to navigate our interventions to adapt to the environment. This pushed us to utilise multiple mediums, and shift to SMS, TV and radio, in order to reach learners that did not have access to smartphones.

#### **How serious is the digital literacy gap in India?**

Computers, smartphones, internet, and social media

networks have increasingly become integral parts of our lives in the 21st century. However, in India, there is a glaring digital literacy gap across urban and rural, as well as encompassing gender.

The digital literacy divide in India is a key structural constraint that carries multiple negative impacts on educational attainment, skill development, and workforce participation for those who are from under-resourced communities.

#### **Would the Kuznet's curve apply for technology-led economic growth in this country?**

Technology has been theoretically acknowledged as a condition that can both improve or worsen economic equality. In general, technological innovations are expected to generate more inequality initially with only a few enjoying the high incomes of the technologically advanced sector. This is something we have noticed in India with the emergence of information and communication technologies, which catered to the job aspirations of the burgeoning middle class. They have access to digital tools and hence it has been easier for them to apply for such jobs. Additionally, the products and services developed by technological advances have been within the reach of the few. As technologies are diffused, however, more people can enjoy higher incomes and benefits thereof, which could lead to lower inequality. This is what Kuznets curve suggests.

#### **So what is stopping us?**

The Indian Government has been making a concerted effort to increase digital literacy skills amongst its citizens. However, digital literacy is not the only barrier to the expansion of technology in remote rural communities. Access to devices such as smartphones, tablets and computers remains a major roadblock which needs to be overcome in order for everyone to enjoy the benefits of technology-led growth. Technology-led economic growth can be a reality in India once the barriers of digital literacy are removed, and digital tools become more accessible.

#### **Anything you learn or like from what others in this space are doing—like Agastya, Meghshala, Medha, Doorstep, Technoserve etc.?**

We have been working with 90 partners for content creation and translation and more than 600 partners for dissemination. 🙌

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## Ranking of the **Best 100 Tech-Enabled** engineering colleges in the country

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# Tata Tele Business Services has grown to be a one-stop digital transformation platform for businesses in India, making them resilient and future-ready

**T**he pandemic disruption has reinforced the need for connectivity and digital technologies like never before. Being digitally agile to support hybrid working may no longer be a choice but a necessity if companies are to remain fully operational under today's dynamic business environment. Tata Tele Business Services (TTBS), India's leading digital services provider, is at the forefront of digitally transforming businesses with its comprehensive portfolio of connectivity and cloud solutions to make them resilient and future ready. In an exclusive chat with us, Mr. Mannu Singh, Vice-President, Tata Teleservices, talks in detail about TTBS initiatives to support enterprises in their digital transformation journey.

## How is TTBS supporting businesses post pandemic? What are your focus areas going forward?

The pandemic has made businesses realize that they must embrace technology to transform their operations for business continuity and growth. Businesses that digitally transform will be able to connect more closely with customers, speed up the pace of innovation and, as a result, claim a greater share of profit in their sectors. Therefore, at TTBS, we encourage businesses to develop "digital first" mindset that help build resilience and operational efficiencies across their value chain to make them future ready. TTBS has an extensive, high quality and robust wireline network and offers largest portfolio of smart and secure solutions involving Cloud & SaaS, Collaboration, Connectivity, IoT, Marketing & Cyber Security solutions. These solutions are an amalgamation of unique features that appropriately address the security aspects arising out of a hybrid working environment and enable enterprises to have seamless connectivity while serving their customers with utmost efficiency.

TTBS has grown to be a one-stop digital transformation platform for businesses in India. The company has expertise in both the digital and the connectivity space and this enables us to take end-to-end ownership of the entire solution, be it devices, applications, or connectivity.

Our customer centricity approach touches every aspect of the value chain of the organization and our largest channel partner network across 60 cities has enabled us to sustain a growth trajectory which has been better than the industry.

In Enterprise segment, significant growth is expected in SaaS, IaaS, Cloud and IoT and we will continue to build our capabilities in these.



**MANNU SINGH**  
Vice-President, Tata Teleservices

## TTBS has launched series of new solutions recently, please elaborate thought behind these?

TTBS has leveraged its customer expertise and has taken several initiatives in the recent times to empower Enterprises with innovative and reliable solutions that significantly boost their competitiveness. For many businesses, especially Small and Medium Business (SMBs) lack of technical know-how and resources remains a crucial problem when it comes to taking care of their IT and security needs. Our overall market strategy is focused on accelerating the adoption of digital technologies by businesses aspiring to Do Big. We are committed to democratize cutting-edge technology and empower the businesses with innovative and affordable bespoke solutions.

TTBS has strengthened its portfolio of enterprise grade solutions such as:

- **Smartflo:** an advanced cloud communication suite that enhances customer experience by streamlining call flows and tracking performance with detailed reports and advanced analytics.
- **SD-WAN iFLX:** an advanced networking solution with intelligent and flexible networking capabilities helps businesses accelerate their digital transformation.
- **Smart Internet:** Industry's first smart internet leased-single suite combining high speed internet with cloud-based security and greater control at an optimized cost. We bundled the best of internet and security features with convenience of manageability.
- **SmartOffice®:** It is literally an office in a box, which integrates voice, data, storage and applications in one device and saves a customer the time, effort and complexity of working with multiple service providers in setting up an office. It is as appealing to a start-up as it is to an established organization wishing to open a branch office.
- **Ultra-Lola:** This is a technologically superior point-to-point offering, with latency in microseconds, which enables brokerage/BFSI companies that must stay securely linked to process market data in real-time.
- **EZ Cloud Connect,** an easy, fast, reliable, cost effective and secured Point to Point (P2P) cloud connectivity gateway. EZ Cloud Connect enables Enterprises to bypass the internet and deliver data to and from the Cloud Service Provider (CSP) by establishing a dedicated private network connection.
- **Cyber Security Portfolio:** Cyber- attacks like phishing, ransomware are becoming more pervasive and sophisticated. We have introduced a Cloud Content Security Platform (CCSP), to offer email security, web security, next generation firewall, endpoint security and multi-factor authentication (MFA) to address the growing need of security solutions.
- **Collaboration Solutions:** to address the continuous shift in modern workplace, where employees expect more openness, collaboration and flexibility in how they stay connected, we launched a host of plug and play collaboration solutions, such as web conferencing solutions, hosted interactive voice response ('HIVR'), and international bridging services ('IBS').

## How is Smartflo helping enterprises in their cloud communication requirements?

Cloud will be central for all the transformational technologies for modern businesses, as they now want to be digital-first organizations and need cloud solutions that help in Enterprise applications such as CRM, analytics, retail, voice and data etc. Smartflo is an award-winning, futuristic cloud communication suite that offers sophisticated convergence of digital connectivity, business intelligence and productivity. Smartflo empowers businesses to strengthen engagement with customers through seamless

communication, anytime and anywhere and through any device. The setup is quick with no capex investment and comes with an uptime guarantee of 99.5% backed by TTBS 24X7 managed service capabilities and trust, ensuring uninterrupted business continuity. Smartflo solution is being adopted by thousands of businesses across industry verticals like BFSI, IT/ITES, Manufacturing, Education, Fintech, Logistics and E-commerce and helping them boost their customer experience.

## With Hybrid work being the acceptable norm, how do you see the unified communication space shaping up? How is TTBS partnership with Zoom unfolding?

The fundamental idea behind TTBS partnership with Zoom is to offer an intuitive, scalable, and secure unified communications solutions to enterprises and individuals alike. This partnership will enable businesses to have access to comprehensive conference services such as Zoom Meetings, Zoom Webinars and Zoom Rooms on our state-of-the-art, high-capacity digital connectivity Network. Businesses can use our bespoke Zoom customization that integrates with their existing solutions, helps keep tabs on all client-facing conversations and bolsters security. The platform provides a host of unique features like Live Video, streaming of Video Webinars for up to 50,000 viewers, include one click access, video, voice, content sharing, recording, virtual backgrounds, company branding, multi-layer security, and meeting participation of up to 1000 people on video from locations across the globe, making communication more interactive and engaging.

## How is Smart internet going to help Enterprises?

Seamless, smart and secured connectivity is no longer a luxury but a necessity.

Today, the internet has become the instrument that supports the work and life of hundreds of millions of users across industries. Protection, control and manageability are the fundamental components required in a smart network. Smart Internet has been developed with an endeavour to minimize cyber-attacks encountered by businesses especially SMBs and provide them with seamless connectivity entrusted with advanced security at an affordable price. With Smart Internet, businesses can now easily access bandwidth-heavy applications on our highly- secured and high-performance network with real time usage control and manageability to enhance their productivity.

To know more how TTBS can be help you in your business growth, please contact **TTBS Business Manager** @ 1800-266-1800 (Toll free) [https://www.youtube.com/watch?v=IbOitUhRgJw&list=P\\_LrW9y48k3aJNRiVi-pj4CWQ0ZluPZkfF8](https://www.youtube.com/watch?v=IbOitUhRgJw&list=P_LrW9y48k3aJNRiVi-pj4CWQ0ZluPZkfF8)

# Why a 5G Delay Can Benefit India

A 5G delay works in favor of policy development. Telcos had demanded a year's extension on 5G trials but have got just 6 months. The three largest telcos have developed a lot of interesting use cases. Reliance Jio has taken an early lead with a variety of enterprise-oriented use cases. However, Bharti Airtel and Vodafone Idea have also caught up with the market leader



BY HEMANT KASHYAP

Recently, it has become more and more obvious that 5G, with all its pomp and show, will not arrive in India any time soon. Though it might sound like bad news, a 5G delay might actually be a good thing.

In the first edition of 5G Spotlight, we explore how delaying 5G can actually be positive for the long-term future of the standard in India.

## India Has an Infantile 5G Ecosystem

India is one of the largest 5G smartphones markets in the

world without a 5G network. According to CyberMedia Research, by the end of 2021, India will have 25-30 million 5G smartphones. That reflects on a good start of 5G proliferation. However, given that 4G devices will cross the 800 million mark by the end of FY22, it goes without saying that while 5G has made a good start, yet that's it. It has just started.

For a market as large as India, every single stakeholder will look to tap into the magic that is Economies of Scale. This allows for lesser costs per user and hence helps

According to CyberMedia Research, by the end of 2021, India will have 25-30 million 5G smartphones. That reflects on a good start of 5G proliferation.

drive profits. Telcos already do this; when they invest in their networks, those investments are neither cheap nor meant for a few people.

When the telcos launch commercial 5G networks, they will have a significant number of users. The number of 5G devices notwithstanding, the 5G devices themselves are a bit of a problem. There are a few devices that will support enough bands to operate properly in the Indian market. What's more, the mobiles that support all major 5G bands are worth a pretty penny.

India is off to an exciting start in developing its 5G ecosystem, but it is just that. A start.

### We Are Yet to Connect Every Indian

As of now, there are over 1.1 billion telecom users in India, with over 98% of them being wireless users. However, that still leaves about 200 million people who don't have access to telecom services. India has been the second-largest telecom market for quite some time. However, there are far too many people that still either don't have access to connectivity or have very poor access.

During the first lockdown that started in March 2020, we saw what access to connectivity truly meant. COVID-19 exposed the lack of access and the damage it did.

The government has been working to resolve the disparity. The ambitious BharatNet project aims to connect every village with fiber access; so far, it has connected 70% of all villages in India. Apart from this, there are so many remote regions in the country that have a very poor quality of connectivity. The new phenomenon of LEO satcom will also work with telcos to expand the reach of their networks to cover more and more of the population.

This just goes to show that while 5G will herald a new era of innovations in the digital sphere, we also need to ensure that these innovations reach everyone.

### The Policy Framework Needs Work

Recently, the DoT had set up a committee to create policies for the commercialization and monetization

of 5G. Essentially, the government wants to know the viability of having 5G networks. This includes having information about the current availability of 5G products, devices, and applications. It also includes making 5G devices more widely available to the customers, and what can stakeholders do to ensure that.

While the telecom department works on this, the TRAI has started consultations with industry stakeholders over the 5G spectrum.

A 5G delay has been caused by, and works in the favor of, policy development. While the DoT works out the details and fleshes out the policy, TRAI can carry out consultations and create recommendations accordingly. Both of the telecom bodies need to work in tandem like they always have. DoT has also been playing with the idea of allocating spectrum administratively. While that sounds like a good idea at first, it caused much controversy and litigation during the 2G spectrum allocation. Therefore, the government will proceed with caution this time around.

Apart from this, core policies such as the National Frequency Allocation Policy and the Spacecom Policy are still on the drawing board.

Pushing back 5G rollouts will allow everyone enough time to formulate policies accordingly, in a way that avoids litigation in the future. Right now, the government and the telcos are embroiled in quite a lot of cases. From OTSC to AGR cases, the telecom sector has been rife with litigation. Having a proper policy framework will avoid litigation in the future.

### Telcos Need Time to Develop 5G Use Cases

Since the 5G trials started in June, the three largest telcos have developed a lot of interesting use cases. Reliance Jio had taken the early lead with testing a variety of enterprise-oriented use cases, and 5G VoNR. However, Bharti Airtel and Vodafone Idea have all but caught up with the market leader.

Airtel has recently announced its #5GForBusiness, a string of 5G-based enterprise solutions. Vi, on the other hand, has repeatedly achieved the highest speeds in 5G

Reliance Jio had taken the early lead with testing a variety of enterprise-oriented use cases, and 5G VoNR. However, Bharti Airtel and Vodafone Idea have all but caught up with the market leader.



trials. Vi claimed to have hit a top speed of 9.85 Gbps on its 5G network. For context, Jio and Airtel are yet to break the 2 Gbps barrier, and Vi's top speed outstrips those two by almost a factor of 10.

However, all said and done, the telcos have not achieved much in the way of B2C applications of 5G. While enterprise might be the focus of 5G, individual users still represent the largest market for these telcos. Hence, the telcos had demanded a year's extension on 5G trials. However, the government has only given them a 6-month extension, which will see trials run till May 2022.

Will the government be ready with the spectrum auction by the time that happens? Almost certainly. The factors that have contributed to the delay in 5G rollouts will also end up securing 5G's future in India, it seems.

### 4G Still Is Good Enough

What's wrong with 4G?

That is the question that we get to hear the most when asking a normal person about 5G. And they are right. In the 5 years of 4G, India has not seen high-quality 4G networks. 4G still has an upper download speed limit of 100 Mbps, but the current networks in India top at 20.9, which Jio hit in September, according to Ookla.

In March this year, the telcos invested heavily in the 4G spectrum (at least two of them did). This saw the telcos get an additional spectrum, which they then deployed in many regions across the country. During the last week of

June, Airtel and Jio undertook mass upgrades to their 4G networks across several parts of the country. That was a move that reflected the ability to invest Capex in 4G networks; more importantly, it reflected a commitment to deliver good 4G.

However, India is still very far from delivering a seamless 4G experience. Working on 4G networks should be a bigger priority for telcos than rolling out 5G at this point in time, for at least the next two quarters.

### 5G Delay – A Blessing in Disguise?

Looking at it from a neutral perspective, we can see why a 5G delay might actually do more good than harm. The current networks can use some polishing and upgrading to tap 4G's full potential, the telcos can use some time to brush up their expertise on 5G and whatnot.

The general public sentiment in India has been altruistic towards 5G. Many have questioned the need for a network upgrade when we had one half a decade ago. What's more, India's connectivity issues make it seem that a 5G rollout will only paper over the cracks. However, 5G's potential makes it an important exercise for the government to facilitate rollout.

It doesn't have to be right now, though; taking the time to make proper policies, letting telcos have a proper frequency portfolio, and giving them time to develop 5G use cases will go a long way in securing the future of the telecom sector in general. 🙌

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## Various business models and opportunities are emerging for companies to monetize from 5G

- Mobile phone manufacturers are exploring partnerships with TSPs for wider distribution of B2C devices (mostly future proofing consumers for 5G services)
- Mobile device manufacturers are now entering other markets such as wearables, hearables and other IT hardware to maximise their gains from 5G.
- For broadband CPE manufacturers, 5G wireless broadband is a good opportunity since the broadband (cable modem, DSL, or fiber) penetration in India stands at 55.7 per cent as of June 2021.
- Manufacturing, government, construction, and service robotics provide opportunities for
- 5G use. Areas such as video surveillance, AR/VR, large-scale sensor networks for smart cities, AI-assisted remote diagnostics, industrial vision with IoT devices, and image recognition and remote- controlled 5G UAVs are some prominent categories for smart device usage.

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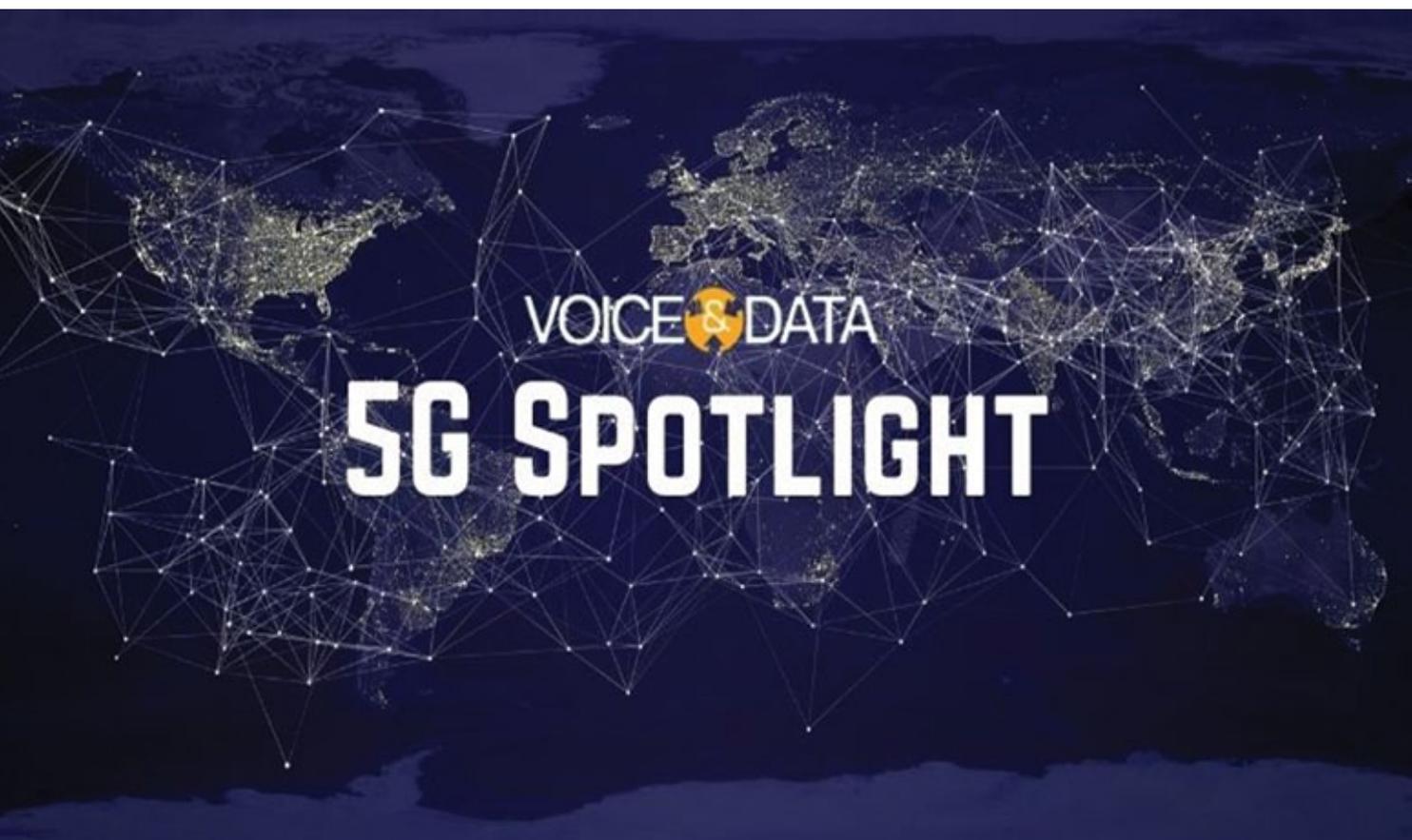
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# Metaverse, and 5G – A New Synergy for the Future

A metaverse represents a great monetization opportunity. Demand for devices will grow and Qualcomm is looking at a \$700 billion opportunity. As smartphone mobiles would become the first devices used to access the metaverse



BY HEMANT KASHYAP

**W**hen Facebook changed its name to Meta, it started what could prove to be the first iteration of a metaverse. While the technology behind a metaverse has been talked about to the point of becoming buzzwords, what does it mean? Why is a metaverse important?

And, keeping in line with the DNA of V&D, how will 5G help? In the third edition of 5G Spotlight, we dive into the virtual world of metaverse – the internet of the future.

## The Tech Behind Metaverse

First things first, since metaverse promises to be

The demand for devices will grow, and Qualcomm has one of the largest stakes in consumer devices. Therefore, according to the CEO, the company is looking at a \$700 billion opportunity.

such a breakthrough, the technology has really been talked about. 5G, AI, ML, AR, and VR, have become, as I mentioned before, buzzwords, however, each of them plays a crucial role in making it possible. Here are some of the components of a metaverse, in no particular order.

#### • Artificial Intelligence

Currently, AI has many roles to play. The world has been harnessing its ability to ease complicated tasks by taking “shortcuts” as humans would do. For instance, a smartphone chipset usually has an AI core now, to help with repetitive tasks, saving energy and time. However, AI does not just limit itself to that. AI has an array of “tools”, that can help the metaverse take shape. All through the metaverse, from its infrastructure to its implementation, AI will be at or around the core of it.

Companies delivering metaverses will look to deploy AI at the Edge – taking the vast amount of data generated there and delivering the best value for the customers. Deploying Edge Computing will allow companies to make the most of data – the new oil. AI will also allow decentralization of everything that goes into making a metaverse. With open networks, open RANs, and open APIs, AI will enable decentralization, and ensure maximum uptime, while delivering the best service quality at all times. With decentralization, AI will also allow smart control over the metaverse for the administrators, which is just as important in a successful implementation.

However, apart from the enabling role of AI, it will also help shape the metaverse.

Using AI, developers have been creating the “avatars” within the metaverse; it will help create photorealistic representations of real users. More specifically, companies are using AI to reduce the time it takes to make a photorealistic model of a person. Along with this, since a metaverse will allow people to interact with the objects inside it, developers are using AI to optimize interfaces. From Elon Musk’s Neuralink to eye-tracking technologies, AI will help create ultrarealistic environments within the metaverse.

One of the last stages towards perfecting a metaverse would include merging language and vision. Right

now, AI-powered language processing models are not visually-aware; they don’t know what they’re looking at. Soon, though, they will become a reality, and therefore, it will lead to even more realistic AI storytelling, creative partnering, and machine understanding.

#### • The Devices

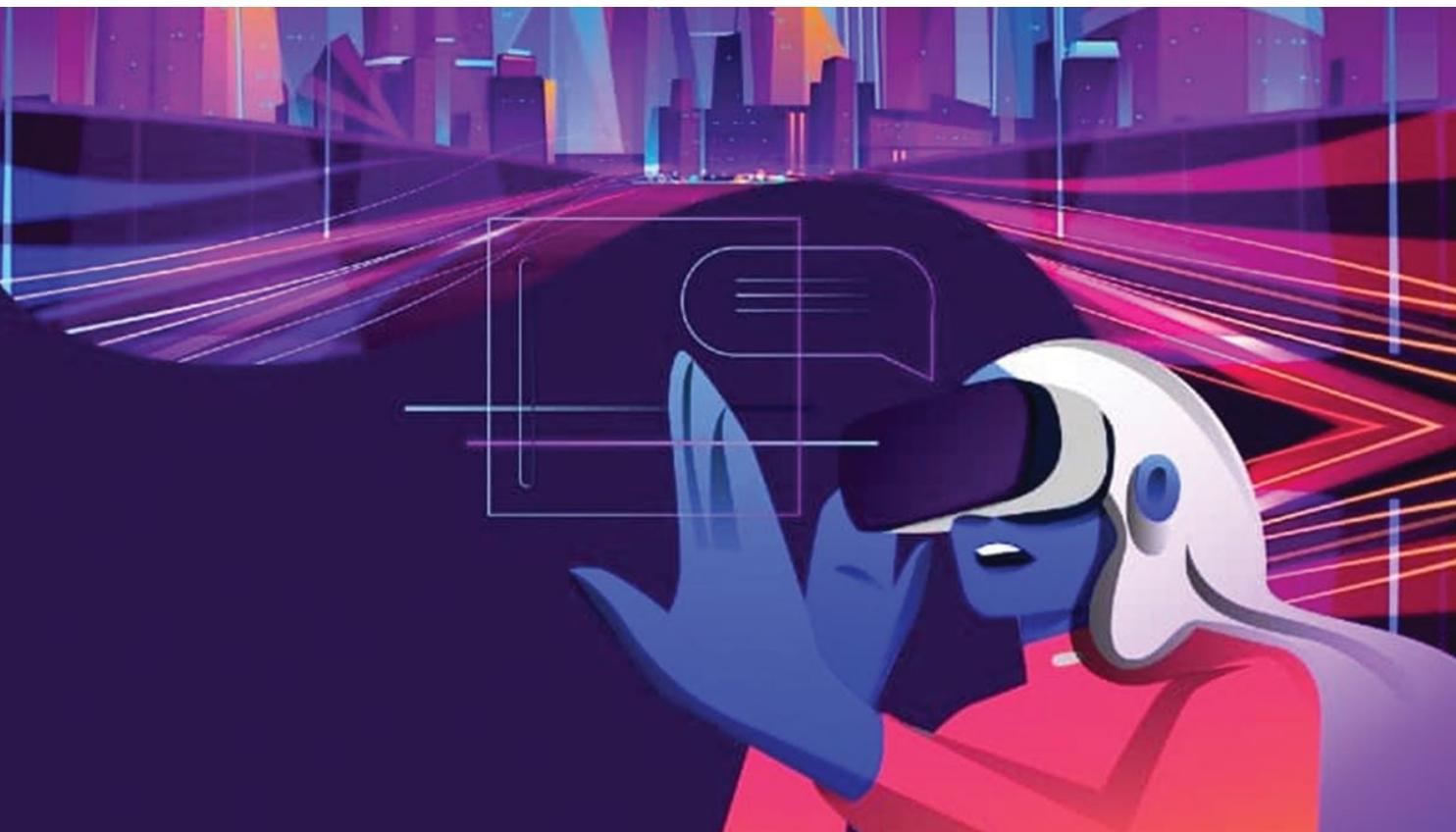
The only way people are going to interact with a metaverse is via devices. XR devices such as smart glasses, and immersive headsets, are something that tech giants like Meta and Qualcomm are riding hard on. Meta has already had its own VR headset, called Oculus. What’s more, Qualcomm’s Snapdragon chipset powers Oculus, and thus, the chipmaker has reasons to believe that metaverse will become big over the next few years.

VR headsets for metaverses are not the only gadget Qualcomm makes; it also makes equipment for drones, wearables, smart city operations, industrial sensors, and others. However, the smartphone business remains the most important devices business for Qualcomm. Incidentally, mobiles would become the first devices used to access the first metaverses. However, Cristian Amon, the CEO, said at a recent event, “there’s more to Qualcomm”.

Because of the metaverse, the demand for devices will grow, and Qualcomm has one of the largest stakes in consumer devices. Therefore, according to the CEO, the company is looking at a \$700 billion opportunity.

“If you’re going to spend time in the metaverse, Snapdragon is going to be your ticket to the metaverse,” Amon added. Since many large tech companies are planning their own metaverses, Qualcomm’s interest comes as no surprise. A metaverse represents a great monetization opportunity for everyone involved – from device makers to telcos.

The conversation is not limited to just headsets. Companies such as HaptX have been developing VR gloves, which will use haptic feedback to allow people to “touch” things inside the metaverse. Equipped with a headset and a pair of gloves, users can pretty much interact with objects inside the metaverse, for a truly



The Next Generation of the Internet

Image Credit: Mashable

immersive experience. There is virtually no limit to what devices can do, all we have to do is wait.

• **Extended Reality Technologies – AR and VR**

In essence, Metaverse will use AR and VR as user interfaces, albeit nothing of the sort we see right now. We already know the potential of AR/VR. However, right now, it has limited application outside of games such as Pokémon Go. In a metaverse, the developers will use AR/VR for spatial computing, or, to render the space around a virtual person, an avatar inside a metaverse.

Spatial computing, in essence, is something that RPG games have been doing. However, with a metaverse, that experience will become a first-person experience, rather than the third-person experience a video game provides.

*Spatial computing proposes hybrid real/virtual computation that erodes the barriers between the physical and the ideal worlds. ... Wherever possible the machine in space and space in the machine should be allowed to bleed into each other. Sometimes this means bringing space into the computer, sometime[s]*

*this means injecting computation into objects. Mostly it means designing systems that push through the traditional boundaries of screen and keyboard without getting hung up there and melting into interface or meek simulation.* – Simon Greenworld, Spatial Computing

Since Greenworld first published his work on spatial computing, the world has seen rapid developments in the field. We have already discussed the hardware side of things, and AR/VR enables the software aspect of the metaverse.

Here, the software will allow for the following:

- 3D engines, to display geometry and animation. Game studios, with their expertise in worldbuilding and rendering, will play a critical role in the beginning.
- Mapping and interpreting the inside and the outside world. This includes geospatial mapping and object recognition.
- Data integration from devices and biometrics from people.

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These use cases might appear niche, with only as much as 30% of users going for them. However, these use cases can increase telcos' ARPU by as much as 9.5%.

- Voice and gesture recognition, to allow for better interactions within the metaverse.
- Next-generation UIs to support multiple, simultaneous information streams and analysis.

With extended reality technologies, there is no limit to what a metaverse can do.

### 5G – The Bedrock of the Future

With its low latency, high speeds, and high capacity, 5G will become the first generation of networks to properly support a metaverse. A metaverse, as we have discussed, will be the next-gen way of delivering the internet experience. Right now, our internet experience comprises of opening multiple tabs on our browsers, using apps, and so on. On the other hand, within metaverses, we will get everything in a single place. All of this requires a network that can support huge data traffic that these metaverses will generate.

AR and VR have been around for years now, but with 5G, companies can deliver high-quality content with better latencies and network qualities. Telcos need to partner with companies in the field, develop use cases and look to monetize the network further. VR will benefit the most from 5G's network capacity and speed. Since VR service providers can stream ultra-high quality content. This can be used at museums and sports arenas, for example. This can also translate into an ARPU rise of 4-5%, per McKinsey.

These use cases might appear niche, with only as much as 30% of users going for them. However, these use cases can increase telcos' ARPU by as much as 9.5%. For telcos to succeed, they need to develop an ecosystem, so they can provide a catalog of user experiences. 4G saw the telcos being reduced to just CSPs, with no role in the value chain. Even though 4G transformed how people work and developed new habits, telcos were more or less left out of all the value that followed. Since 5G offers more use cases, it offers telcos more headroom and allows them a better place in the value chain.

A few years ago, pre-4G, customers valued simplicity. This reflects upon the evolution that 4G sparked, and 5G would carry forward; customers now are adapting more

to immersive experiences. The metaverses will only represent the move towards more immersive internet experiences.

### When Will It Be Actually Relevant?

The devices are going to be the way how people interact with the Metaverses of the future. I say Metaverses because every company would want their own take on it. Meta has already started on the path and will trailblaze for companies like Apple, Google, and Microsoft to follow up.

Why those three?

The three tech giants have the largest ecosystems with devices and software solutions in the world. Therefore, if anything, these companies will bring out some iteration of their own metaverse down the line. And why not? A Google metaverse, let's say, as an extension of its Android Ecosystem, looks like the next logical step. There are literally hundreds of millions of Android-powered devices across the world, if not billions; Google has a huge opportunity. It's the same for Apple and Microsoft; they, too, have large device ecosystems, and moving on to a metaverse, integrating every device and service in one place, has to be the next evolutionary step.

But then again, we're getting ahead of ourselves.

According to a Qualcomm report from last year, XR devices will follow a similar trend as that of mobile phones. Therefore, if we are talking about a truly immersive experience, it will take time. Mobiles took some 30 years to develop to the form factor we are familiar with; expect a similar, although steeper, trajectory from AR/VR devices.

Therefore, for at least the next decade or so, metaverses will remain experimental at worse, and a novelty at best. However, this is not to undermine the potential of the technology. As I mentioned in the beginning, metaverses are going to be the future of the internet. The way we interact and ever perceive the internet will change radically over the next few years.

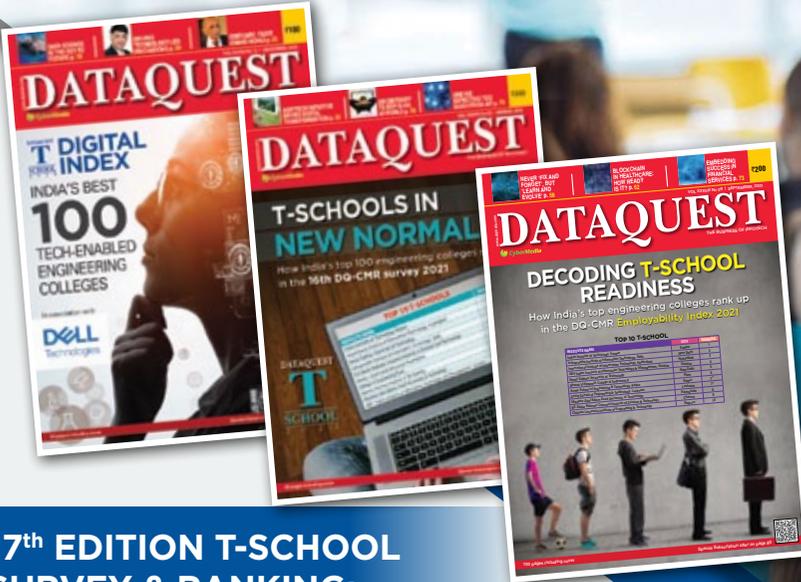
Needless to say, exciting times are coming. 🍀

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# Leveraging IIoT for future-proofing businesses

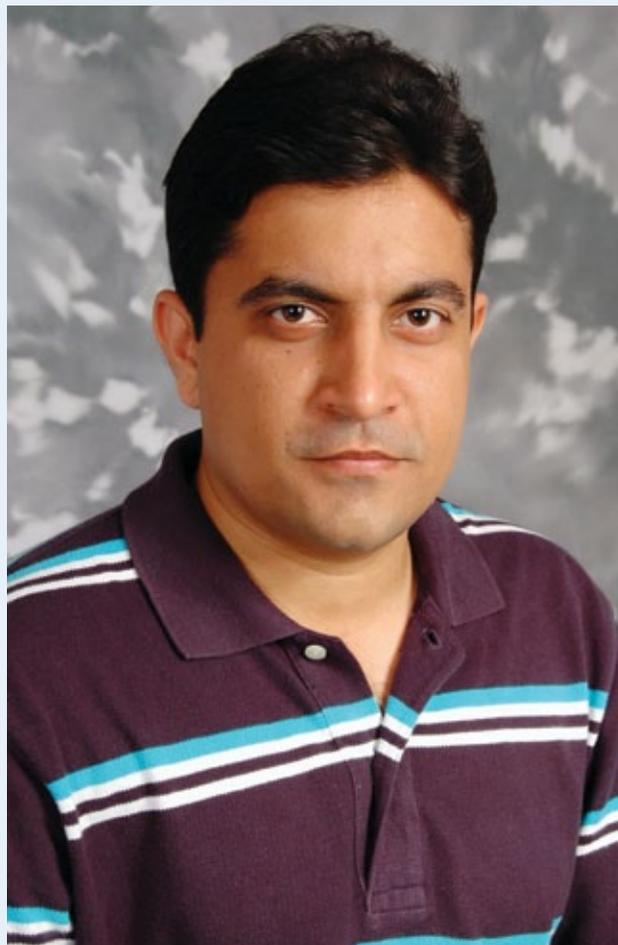
The Industrial Internet of Things (IIoT) makes for a smart manufacturing environment using a fully connected, transparent, automated and intelligent setup, giving enterprises better efficiency and reliability in their operations. Today, IIoT has ushered the next step of Industry 4.0. By allowing the integration of complex industrial processes through automation and cloud computing, IIoT is modifying existing systems to integrate men, machines, and the manufacturing process into a structured mesh of interconnected devices – allowing data collection, exchange, and analysis for improved productivity, efficiency, and output.

## IIoT in the New Normal

The benefits of IIoT can today be optimally realized in general manufacturing that is encountering recurring challenges in lack of real-time monitoring, inconsistencies in measurement, and absence of precise predictive analytics. Further, interpretation of data has been a challenge, preventing manufacturing firms from appropriately implementing industry recommendations to optimize performance. Here, IIoT can play a driving role in undoing barriers of insufficient equipment effectiveness and downtime.

Given the unprecedented nature of current times, IIoT promises to help enterprises navigate through a series of crises: ensuring business continuity during Covid-19; returning to business with increased flexibility; and lastly, improving and adapting businesses in a world changed by the pandemic. According to the Vodafone 2020 IIoT spotlight report, 84% of companies that had begun to adopt IIoT tech found it positively impactful for their business during Covid-19.

The global IIoT market is expected to grow even faster than expected once the world enters a new post-Covid-19 business environment, with the release of pent-up demand and new technology investments to minimize impacts from future disruptions. The industrial IIoT market is expected to grow at a CAGR of 16.7% to reach USD 263.4 billion by 2027 as per a World Economic Forum report, driven by applications such as industrial automation and predictive maintenance.



**ANKUSH KHANNA**  
Director-Commercial Brand Marketing  
(South Asia Pacific), ExxonMobil

Enterprises will increase automation investments for future-proofing against pandemics and increasing resilience.

India too poses an incredible opportunity for the digitization of manufacturing industries. As per Deloitte's recent survey, the Indian IIoT market was expected to grow ~7x to USD 9 billion by 2020 which is drawing attention from leading players of the IIoT world. With the government's push for the ambitious Smart Cities Mission, IIoT adoption could be seen happening across industries such as utilities, manufacturing, automotive and transportation, plastics & logistics.

## Leadership in Manufacturing and Innovation

Mobil™ Lubricants develops and applies next-generation technologies to help safely and responsibly meet the increasing global demand for energy and high-quality chemical products. Mobil has since long assisted manufacturers in creating equipment that produces high-quality parts and products for every unit, whether made in long runs or short custom campaigns. Mobil's complete line of hydraulic oils is formulated to assist manufacturers in ensuring their operations are running efficiently.

Along with a complete line of hydraulic oils, gear and compressor oils, and greases, Mobil also provides a wide array of technical services under its Mobil Serv<sup>SM</sup> Program, such as Mobil Serv<sup>SM</sup> Lubricant Analysis, hydraulic inspection, energy efficiency study and IIoT insights, catering to industries such as plastic, auto-components, cement, steel, wind & turbines, coal and gas turbines, among others.

Among these services, Mobil Serv<sup>SM</sup> IIoT Insights is a next-gen condition monitoring program that transforms oil maintenance with live information and actionable insights through IIoT technology. It is a vital tool that monitors the lubricant health in real-time and sends instant real-time alerts.

Therefore, Mobil Serv IIoT Insights is a much-needed asset to help manufacturers make swift decisions while safeguarding their business efficiency. Additionally, it helps them save on oil consumption and the total cost of operation, enables early detection, immediate reporting, and much more.

The latest offering can boost manufacturing efficiency with AI insights and automated data collection. To amplify the efficiency of machines, Mobil Serv

IIoT solution can turn raw data into meaningful recommendations.

## Mobil Serv's IIoT Insights Boosting Production and Efficiency

For more than 150 years, Mobil has harnessed new technologies to better provide energy for the world. That effort continues with a growing focus on digital technology.

Today, the company uses high-performance computing, advanced data analytics, and increased connectivity to transform how the organization works at every level of its operations and enhances the way it interacts with customers. A digital mindset has been adopted across Mobil, enabling greater agility, speed and value without sacrificing discipline and rigor. The company has also launched cutting-edge collaborations with Microsoft, IBM and Intel to push into new areas – like quantum computing – to help tackle modern energy challenges.

The ability of Mobil Serv IIoT Insights to convert raw production data into actionable insights and its AI/ML-powered functionality helps the manufacturing team receive customized alerts, optimize energy consumption, measure equipment effectiveness, and enable trend monitoring, among others.

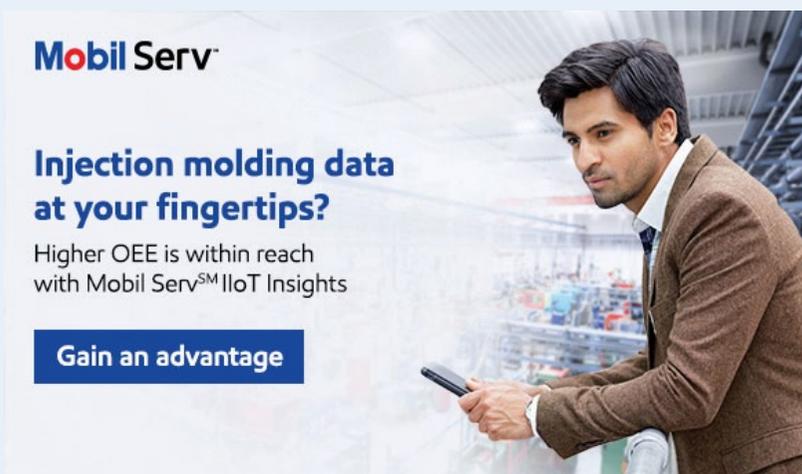
IIoT Insights makes minor hardware integrations and configurations seamless to enable machines for automatic data capturing. Control panel data is interfaced into the Mobil Serv IIoT solution through a gateway installed at the site.

With the Mobil Serv IIoT solution, site managers can receive an aggregated data view for their management reporting, e.g., daily production details, machine run time, downtime details, etc.

Additionally, the solution enables direct access to

high-level business metrics like machine overall equipment effectiveness (OEE), energy consumption, and other production details. It also helps gain insights into drivers of underperformance through high-level metrics while also identifying the opportunities for increasing efficiencies.

Mobil Serv IIoT Insights is thus the much-needed cloud-based solution for the manufacturing industry to turn insights into action and achieve improved efficiency and overall productivity.



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# Monetization in Satcom – Should the Players Focus on B2B?

Satcom players are sitting on a multi-billion-dollar opportunity. India alone has millions of people who have no access to the internet. A policy framework to facilitate satellite communications will bring Internet to every nook and corner



BY HEMANT KASHYAP

It has been an open secret that satcom is the next big leap in communications technology. Therefore, given the opportunities it will create for people and companies alike, the big question is: how do we monetize this?

## Opportunities for Satcom Players

In an answer to a question asked by V&D at India Satcom 2021, Rahul Vatts, Chief Regulatory Officer at Bharti Airtel, and Director, OneWeb, listed out what satcom capabilities can deliver.

“We (OneWeb) are generating capacity on your network with low latencies, and whatever applications come out to us are welcome, whether it is maritime,

whether it is in-flight connectivity, whether it is a government user, defense user, really, it’s a matter of having stock ready with stuff to give to customers, and we have those capacities available. So, we welcome the opportunities that come out”, he said.

In the same vein, Chris McIntosh, CEO, Methera Global Communications, said, “When we look at those areas with a focus on monetizing, of course, in-flight (connectivity) is an area of interest, especially military as well as civil, and defense market as a whole is an area which we know generally has some form of premium”.

In short, satcom can do a lot.

Right now, satcom in India is far from cheap; Starlink had started pre-bookings in India back in June, for \$99, or roughly Rs. 7,500.

### The Allure of Enterprise

Here's a number: 300,000.

That is the total satcom connections in India right now. All enterprise. This should serve as foreshadowing for the next-gen LEO constellation operators. In India, terrestrial networks rule the broadband market, and it would be hard for satcom players to crack in. Therefore, the enterprise represents a huge opportunity for monetization in the early days of satcom in India. Speaking at the India Satcom 2021, Rahul Vatts emphasized the same.

"Generally the initial start happens with these sorts of applications; government is one of the bigger users for such capacities in the beginning, so there are bigger opportunities in the B2B space initially because B2C is largely still taken up by the terrestrial customers. So, it's a matter of having everything under the B2B to go off", Vatts said.

With the government developing a policy framework to facilitate satellite communications, things are looking on the up. In July, DCC accepted TRAI's recommendation of allowing VSAT players to provide satellite backhaul to telcos.

The biggest enterprise business is that of providing backhaul to cellular sites. Up until recently, a satcom player in India had to acquire an NLD license to do so. However, after the government scrapped NLD for satcom, it has become easier to provide backhaul. Along with satellite backhaul, in-flight connectivity, defense, and maritime applications also are huge monetization opportunities.

This means that not only the satcom companies can now install ground stations to better amplify and distribute their bandwidth, they can also provide backhaul.

### The Promised Land of B2C

There are more people than companies at any given time in a country. Except maybe Monaco.

However, assuming that as a general trend, there is more money in B2C than B2B, simply because of

the larger number of customers. The same is true for satcom too; the operators know that. However, right now, satcom in India is far from cheap; Starlink had started pre-bookings in India back in June, for \$99, or roughly Rs. 7,500.

Convincing the end-users to move from terrestrial networks remains the primary challenge for satcom operators. Why would a user want to go away from their WiFi, install a dish, and have internet delivered from space? It is a hassle for the customer any way you look at it. The promise of satcom lies in the magic it can deliver. The novelty will prove to be a good selling point; after all, when I get a Starlink connection, I'm going to be fascinated by it for at least a month. But what then?

Satcom players are sitting on a multi-billion-dollar opportunity. India alone has millions of people who have no access to the internet. The government has plans to change that status quo; this also represents an opportunity for private players. Therefore, the industry needs to look at not just the ways to acquire customers but to retain them as well. Given the network capacities, satcom players can build an ecosystem with partners to deliver content bundled with connectivity.

### The Economies of Scale

Telcos across the world have seen substantial cost reductions, because of the ridiculous number of customers they have. Satcom won't be an exception to the magic of economies of scale. However, they need to find that many users first.

Let's talk about Starlink for a bit. Its "Better Than Nothing" beta is live in the US and Canada, and users reported that Starlink charges \$99/month, with \$499/Rs. 37,210 for the antenna, or Dishy McFlatface. However, when the network has moved on to a full-scale commercial rollout, the pricing will go down – at least the monthly bill will.

One calculation on a NASA Spaceflight Forum by the user Robotbeat discussed how much will Starlink cost in the US. Google can also do the calculation for you as well.

For comparison, in India, mobile data costs stand at 68 cents per GB. However, if Starlink achieves the ideal scenario, this figure becomes 6800 times what Starlink would end up costing.

Here is the complete calculation by them:

$$\frac{((\text{cost per kg of satellite hardware}) + (\text{cost per kg launch to operational orbit})) / ((\text{Capacity factor}) * (\text{throughput per kg of satellite hardware}) * (\text{satellite lifetime}))}$$

For a globally available Starlink constellation (capacity factor = 25%) launched with Falcon 9 for \$1000/kg with a satellite hardware cost of \$1000/kg, 2.5GB/s for each 250kg satellite (0.01GB/s/kg), 6.34-year lifetime (200 million seconds):

$$(\$1000/\text{kg} + \$1000/\text{kg}) / (.25 * .001\text{GB}/(\text{s} * \text{kg}) * 2 * 10^8 \text{s})$$
  
in \$/GB = 0.4 cents per GB.

For the early days (when only 4% capacity factor is feasible, and using the more realistic \$30 million per Falcon 9 launch instead of the \$15 million) is:

$$(\$2000/\text{kg} + \$2000/\text{kg}) / (.04 * (17\text{Gbps}/(263\text{kg})) * 4 \text{ years})$$
  
in \$/GB = 10 cents per GB.

What's more, by using Starship instead of Falcon 9, they can bring the costs down even further. This can see Starlink per GB costs slide down to as low as 0.01 cents/GB. This is still ignoring the increase in data throughput capacity that will come from Moore's Law.



Even if Moore's law fails in the near future, this still will put expenses far below anything else. For comparison, in India, mobile data costs stand at 68 cents per GB. However, if Starlink achieves the ideal scenario, this figure becomes 6800 times what Starlink would end up costing.

This should serve as enough evidence that satcom can be affordable; it could also be cheaper than terrestrial networks.

### Final Thoughts

At the India Satcom 2021, Chris McIntosh noted the importance of the government's role in satcom's early days.

"Often, where the governments will get the most benefits, is not necessarily where the operators will be able to monetize effectively and efficiently. I agree that we got to take this as a whole and look at the different areas, but I think the key message is that satellite operators have got to realize that somewhere, they'll have to be willing to take a loss, but subsidize those losses from other areas".

Chris further said, "I am a firm believer that the only way in which we can provide connectivity where it's really needed – the rural, difficult-to-reach area – is by ensuring that we can bring in enough of those high-value targets, and high-paying targets, so that the cost for government is therefore reduced. So I see it very much as an infrastructure play, that governments and certain high-value targets, will actually end up paying for".

As Rahul Vatts had also said, initially, B2B will be the focus. Therefore, we will see synergies develop between satcom and other industries. The key high-value targets for satcom operators in India will be the government and the telcos.

TL; DR – satcom companies need to focus first on B2B to start the cash flow and then move to the B2C market. 🍷

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# Network Modernization - The Core for Digital Transformation Strategies Next

Different applications have different bandwidth requirements. Different policies and bandwidth thresholds can be set and automation can help enterprises provision resources automatically based on demand



BY MANOJ CHITGOPEKER

**T**he accelerated quest for digital transformation and cloud adoption, is driving greater focus on networks. The network has to be modernized as it is the network that connects every aspect of the enterprise backbone – from the on-premise servers to the public clouds and the edge data centers, which can include employees at remote locations or branch offices.

The network plays the most crucial role in any digital transformation initiative. If networks are not modernized to shape up to the demands of the new world, then organizations will struggle to achieve the overall goals of the digital transformation initiative. If the network is not modernized, then the overall gains from moving to the cloud will be lost.

This is corroborated by NTT's 2020 Global Network Insights Report. The report says that cloud and services investments are increasing and outpacing organizations' on-premises infrastructure spends, causing refresh and upgrade patterns to show signs of slow down. In the research, NTT discovered almost half (47.9%) of businesses' network infrastructure assets were ageing or obsolete, which significantly reduced the network's ability to deliver what businesses need. Many organizations (60%) said that by 2023,

networking will be deemed as core to their digital strategies and believed that the network was the platform for digital transformation.

Key steps or initiatives that must be taken to accelerate the journey towards network modernization:

## Network Architecture Redesign

The network design must be architected in a way that it is open and flexible to meet the needs of a dynamic environment that can provide access to applications and services without any connectivity issues. The network must be designed to be programmatically driven and must take into account all the critical facts with respect to the network. This can include the business applications landscape, the cloud services in use and the traffic patterns. As more work moves towards remote locations and video based applications (which consume more bandwidth), the network architecture has to take into account all these parameters.

## Network Optimization For Cloud Environment

For a successful hybrid cloud strategy, it is extremely important for the network to be fully optimized for the modern multi-cloud environment. NTT's 2021 Global Hybrid Cloud Report shows that network performance

Almost half (47.9%) of businesses' network infrastructure assets were ageing or obsolete, which significantly reduced the network's ability to deliver what businesses need. The majority of organizations (60%) said that by 2023, networking will be deemed as core to their digital strategies

and availability is the second biggest barrier to hybrid cloud adoption. Older networks are not able to adapt to the new requirements that are brought about by a cloud environment. The network hence has to be optimized to make use of software-defined networking technologies, network virtualization and maintaining consistent service quality across on-premise and cloud-based environments. This shift allows for greater automation and provisioning of network resources on demand.

### Leverage Sd-Wan For Network Modernization

In a multi-cloud scenario, it is common for organizations to face issues with respect to optimizing bandwidth and reduce latency. This is more relevant for remote locations, as enterprise traffic gets routed from the remote location to a central data center, which is again routed to the cloud. In such cases, the cost of bandwidth can be extremely expensive. If an organization opts for SD-WAN, it can use the software capabilities to decide the most optimum or the most cost-effective path. For example, as many enterprises today use SaaS-based applications, an SD-WAN setup can route all SaaS-related communications directly to the cloud instead of routing it to the data center and the cloud. This helps in proper utilization of bandwidth while reducing latency.

In modern networks, different applications have different bandwidth requirements. Accordingly, different policies and bandwidth thresholds can be set for different applications like video conferencing applications or core applications such as ERP. With SD-WANs, enterprises can set policies with respect to prioritization and ensuring minimum bandwidth, which helps in ensuring service assurance across the multi-cloud ecosystem. Additionally, as SD-WANs have the capability of measuring the quality of network, they are well suited for modernizing the network as they can monitor the network for factors such as latency and packet loss.

Enterprises can also gain from the flexibility of using different connectivity mediums as the basic architecture of SD-WAN is transport service agnostic. Enterprises can use SD-WAN migration as a big opportunity to update. If the SD-WAN is "managed", it takes out the

labour-intensive elements and uncertainties and puts it into the capable hands of dedicated professionals with the training and experience to design and maintain an optimally performing SD-WAN network.

### Automation For Performance

With increasing digitization, the demands on the network have gone up exponentially. Automation can play a huge role in improving the performance of the network without much human intervention. At NTT, we have been using the immense power of AIOps and predictive network analytics operations to proactively detect and alert enterprises of 95% of issues before they impact business health. Proactive scheduled maintenance of networks can help enterprises to proactively resolve issues before any possible performance degradation such as outages or congestion. Automation can help enterprises provision resources on demand, which automatically allocates and deallocates resources based on demand. The eventual goal is to move towards autonomous networks through the ability to automatically monitor, analyse, control, and recover. Most enterprises today do not have the capability to modernize their network. In such cases, it is recommended to take the help of a managed service provider that can help enterprises architect the network and design it by keeping in mind the performance and accessibility requirements for providing exceptional quality of experience for all local and remote consumers. Ideally, enterprises should choose MSPs who have the capability and the infrastructure to provide multiple high-speed cloud connectivity options. This must be well supported by automation, AIOps, analytics and reporting capabilities.

In conclusion, the COVID-19 pandemic is a perfect time to reimagine and modernize your network for the cloud era. This can ensure that your network is in the best shape to address current and future requirements that are mandatory for competing in a digital world. 🌐

*Chitgopeker is Head – Managed Networks and Collaborator Services, NTT Ltd. in India*

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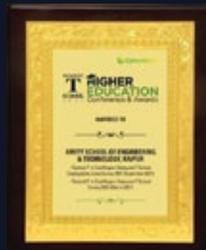
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# 5G and Drones: Wings in Progress

What new intersections or flyovers are shaping up as the drone technology enters the connectivity city? Let's take an aerial view and find out



BY VOICE & DATA TEAM

**T**he best technology is developed not by white coats but by military uniforms. History is proof that when humanity is on the brink of survival, the pressure valve releases exponential ideas and truly-disruptive solutions.

Even if an invention is present beforehand, testing it at scale and with real-world scenarios in a military setting makes it highly amenable for use. We have seen it with flu vaccines for soldiers in the US Army. We have seen it when computers were tried to do calculations for ballistics trajectories. We saw it with the first practical radar system.

Every war unlocks many innovations and instruments that were alien to mankind before. Would the big battle against Covid and the current geopolitical skirmish pave the way for a revolution in drone technology too?

And if so, would 5G be the weapon that drones need to win this game?

## **Why 5G helps Drones? And Vice Versa.**

Bill Ray, VP Analyst, Emerging Technologies and Trends, Gartner opines that while the two technologies can be used effectively together, we do not expect



“Various technologies will be used to maintain a connection with the drone, including cellular networks (both 4G and 5G).”

**Bill Ray**, VP Analyst, Emerging Technologies and Trends, Gartner

to see 5G having a significant impact on drone use with the next five years. “Having said that - there are two aspects where 5G may have an impact on drone operations, the first being support for Beyond Visual Line Of Sight (BVLOS) operations, while the second is remote command and control.”

The first application, as he explains, relates to how drones will be licenced for use BVLOS. “This mode of operation is still illegal in most countries (to fly a drone you have to be have a licenced pilot within sight of it)

but that will change over the next two-to-three years. BVLOS operations will be legal, but the drones will have to maintain a constant connection to the internet. This connection will be used to report location, speed, altitude and orientation, with regular updates (likely to be every 30 seconds in urban areas, every two minutes when rural). Various technologies will be used to maintain a connection with the drone, including cellular networks (both 4G and 5G). We also expect to see LEO satellites used in some instances, along with Wi-Fi and other point-to-point technologies.”

## What Goes Inside a Drone?

Depending on the end purpose of the drone being built, a lot of engineering factors affect a drone’s performance:

1. 4G LTE and/or 5G cellular technology for flying beyond the visual line of sight
2. A virtual private network (VPN) for security and multiple-device networking
3. A.I. for movement and perception capabilities
4. A.I. for Simultaneous Localization and Mapping (SLAM), for obstacle-avoidance, for object recognition and for integrated depth sensing
5. Visual inertial odometry (VIO) for estimating device positioning
6. Flexible software architecture
7. Support for multiple image sensors. This is useful for simultaneous 4k video capture, streaming, and computer vision processing
8. Generous computing capacity on a single printed circuit board (PCB). This helps to create an agile, lightweight, cost-effective and low-touch solution

There is lack of law enforcement clarity. Initially drones would be driven by technology enhancement reasons but mass adoption would take one or two years.

Is a cellular data network a robust enough connectivity option to maintain drone communication beyond the visual line of sight? Or is satellite communication (SATCOM) still the only viable option for autonomous, low-altitude drones that operate at or below 400 feet? Let's first lay two misconceptions to rest. First- Cellular coverage lacks availability at altitudes greater than 400 feet. And second-SATCOM is the only alternative for drones to go beyond the visual line of sight.

As drones fly higher, the visibility of cell towers gets better and that gives higher throughput and connectivity at hundreds of feet in the air. We know that SATCOM offers high-bandwidth connectivity for drones from Low Earth Orbit (LEO), Medium Earth Orbit (MEO) and Geostationary Earth Orbit (GEO) satellites, but the industry is evolving to more alternatives for flying low-altitude drones beyond the line of sight.

Now thanks to 4G LTE and 5G, we can count on wide-area, high-speed, secure wireless network coverage available in an almost omni-present way. That should make 5G a strong catalyst for wide-scale drone deployment. More so, as 5G also clears the way for A.I.-enabled drones for reporting real-time data and conducting mission-critical applications.

It is notable that cellular networks, including 5G, provide very little coverage above 300 meters, as the antennas are orientated downwards to provide coverage at ground level, adds Ray. "Therefore, drones flying above this altitude will be obliged to use an alternative method of connectivity.

As per Ericsson, currently, drones are predominantly reliant on Wi-Fi, and are effective for certain needs in ports, mines, agriculture, airports, utilities, and inshore

## Where Drones Help?

- **Defence:** Military drones that are in use for long as well as smaller, portable drones being used by ground forces. They are being deployed for both surveillance, offensive operations and tactical initiatives.
- **Emergency Relief and Disaster Rescue:** UAVs outfitted with thermal imaging cameras are coming in handy for emergency response teams and first responders for identifying victims who are difficult to spot with the human eye. UAVs have also been used for assessment of damage, location of victims, and delivery of aid.
- **Disease Control:** When outfitted with other peripherals like thermal imaging cameras drones can follow animals and track movement of infectious disease – specially those that hop from animals to humans.
- **Insurance and Real Estate:** Very useful for inspectors and assessors for property insurance for conducting timely and effortless inspections of properties, armed with detailed assessments with high-resolution cameras. They also provide aerial as well immersive visual data and 360 degree walk-throughs for property buyers.
- **Telco:** Used in Telco towers for ensuring service reliability specially in areas where it can be time-consuming or risky to do so manually.

Source: Report from CB Insights

Energy storage technologies such as copper-foam and solid-state lithium-ion batteries will improve things, but both are at least five years from common availability.

and offshore drilling. But once drones make the move to 5G, they can ascend the potential for improved efficiencies, visibility, and safety – according to many experts.

What 5G may help with in case of drones is a spectrum of three areas. One is the ability to automate a drone. Then comes the ability to equip it with real-time analytics and video-based navigation. Next is the aspect of better accuracy and lesser interruptions compared to Wi-Fi

5G drones, hence, could easily be one of the hottest technologies of 2021. In November 2020, we saw Vodafone and Ericsson testing sky corridors for 5G drones at Vodafone's 5G Mobility Lab in Aldenhoven, Germany. Qualcomm Technologies, Inc. has also unravelled the Qualcomm Flight RB5 5G Platform, claimed as the world's first drone platform and reference design to offer both 5G and AI capabilities. Meanwhile Vodafone and Sapcorda, a global navigation company, have also done a pilot for new precision positioning technology to remotely track a vehicle to within just 10 centimetres of its location. BT, with partners like Altitude Angel has been chosen by UK Research and Innovation to deliver Project Xcelerate. An Irish start-up Manna had collaborated with Cubic Telecom for flying delivery 5G-connected delivery drones in Ireland and England. In 2020, BT also announced the UK's first commercial drone corridor, for delivering 5G-use cases for drone technology.

### Not a Smooth Runway Yet

There are many factors to be ironed out before drones can take off to their best levels possible. Apart from power efficiency and usage issues, there are many other non-technical challenges in the air right now.

A critical limitation on the use of drones remains the legislative requirement that the pilot be able to see the drone at all times, as Ray reckons when he looks at the key challenges surrounding this new airspace. "This prevents long-distance flights, as well as inspections that involve going behind a building or other obstacle. Regulators around the world are being pressured to permit flying Beyond-Visual-Line-Of-Sight (BVLOS) and in some countries (such as the UK, the US and China) such flights are currently being trialed. In May 2021 the Indian government has permitted 20 groups to start testing

BVLOS drone operations, having received applications from 34."

He argues that BVLOS regulation will come with a requirement for every BVLOS drone to be registered with a national drone-traffic control body. "So, in most countries a drone-traffic-control network will be established in the next three years, often run by a consortium of mobile network operators. Mobile network operators are keen to provide both the connectivity and the necessary management services. Vodafone and Verizon have been peculiarly active though NTT Data is also a significant player. The FAA ruling on RemoteID has pushed BVLOS sight to the next round of rulemaking, and specifically "allowing the UAS industry additional time to continue developing the network-based UTM ecosystem."

Pavil Naiya, Senior Analyst, Counterpoint Research observes that a majority of use-cases of drones are not clear in India except for IoT-based ones. "There is lack of law enforcement clarity. Initially drones would be driven by technology enhancement reasons but mass adoption would take one or two years. However, with concrete use-cases things can change into a positive and faster traction."

Ray also expands on the power challenge. Power remains a significant limitation, as he reasons. "Energy storage technologies such as copper-foam and solid-state lithium-ion batteries will improve things, but both are at least five years from common availability. We do see some drones using fuel cells, but more likely (for lightweight products) will be super capacitors, which offer extremely fast charging time (reaching full charge within seconds) rather than extending life."

5G can be just the right nudge that drones need to glide smoothly and higher into a future firmament. But that's a war that needs a lot of battles to be won first – like power efficiency, AI integration, data regulations, safety standards and an interoperable ecosystem.

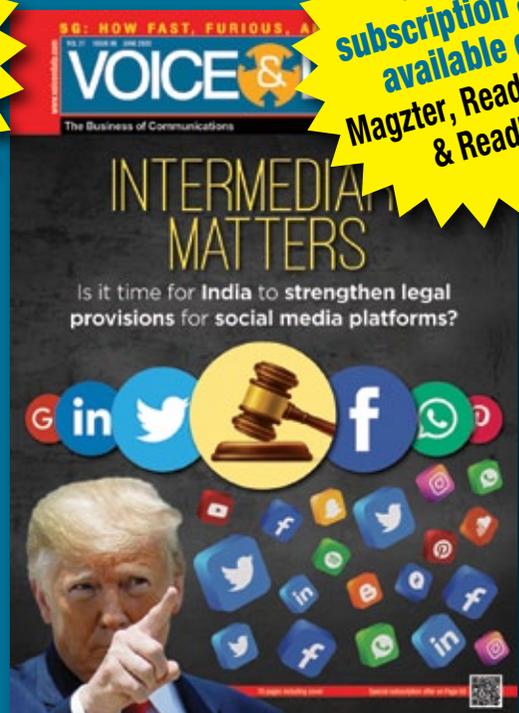
Battles that would be fought not in a field but in labs and corporate war-rooms. 🧪

Source: Report from CB Insights

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# 5Gi to Merge with Global 5G Standards

The ITU approved India-Specific Standard is now all set to merge with the Global 3GPP Standard raising hopes for the future of 5Gi.

BY HEMANT KASHYAP

In the aftermath of DoT's and TEC's opposing ideas, the telecom bodies will look to merge 5Gi, India's homemade 5G standard, with 3GPP's global 5G standard under a "compromised formula".

## Government Relaxes on 5Gi

According to a person familiar with the matter, the Telecommunications Engineering Center opposed the local standard because of issues; the TEC argued that 5Gi



It makes 5Gi a very India-specific telecommunications standard. As such, the government has been very keen on the local standard and its adoption in the telecom industry.

causes interoperability and technology fragmentation. Notably, the merger will happen as the Release 17 by 3GPP; the global body will accept the merger this week. "In a meeting last week, the engineering center opposed the idea of new standards due to technology fragmentation and interoperability issues. Now, the 5Gi and 3GPP 5G merger, as a part of compromise arrangement, has been worked out which is likely to get a go-ahead from the international standards body", the person said.

Incidentally, Qualcomm has been leading the merger initiative. 5Gi has been a matter of intense debate from gear makers and telcos alike. All of the stakeholders involved have almost universally opposed the idea of a different standard than the global one. The opposition has been led by multinational vendors such as Ericsson, Nokia, Huawei and the COAI, the group that represents Jio, Airtel, and Vi. The local standard represents India's first ITU-approved standard. Developed by TSDSI, along with IITs and other academic institutions across the country, the standard specializes in rural applications.

Therefore, it makes 5Gi a very India-specific telecommunications standard. As such, the government has been very keen on the local standard and its adoption in the telecom industry. The DoT even asked the telcos to run trials using 5Gi in the ongoing 5G trials. However, the telcos have called the standard "risky". Vodafone Idea was the only telco to consider running 5G trials with the local standard, but so far, no one has run any successful trial.

### Opposition for 5Gi

The main reason for opposition has been the lack of clarity on the standard from TSDSI. In August, the telcos and gear makers warned the DoT of the lack of completeness and ambiguity in 5Gi's specifications. They said that this will ultimately lead to failure of successful commercialization of the standard. This will also lead to a lesser interest generated in the standard, making it commercially unviable. Many expect that the TEC should ensure that the national standard it creates are complete, error-free, and implementable for the creation of a meaningful ecosystem & seamless deployment of telecom networks, they added.

Along with Indian industry bodies, several bodies from the UK and the US have opposed the mandatory 5Gi adoption; they said that this move can set vital work shared on supply chains back. The bodies also said that alternative RANs such as Open RAN also rely on global standards; forcing 5Gi can make Open RAN adoption impossible.



Bhaskar Ramamurthi, Director, IIT Madras, and former chairperson, TSDSI, said, “5G handsets require only minor firmware and software changes to become 5G+5Gi handsets, which will not lead to an increase in costs.

In a joint letter to the DoT in August, the trade bodies said, “as TEC considers incorporation of 5Gi as a national standard, we hope that it will also consider the importance of globally harmonized standards for 5G to the success of India’s ICT ecosystem. We also ask that, whatever standards are adopted, that the Department of Telecommunications avoid making the use of any one standard mandatory and allow telecommunications service providers to deploy technologies conforming to the standards of their choice”.

#### **Contention Between the Industry and TSDSI**

In August, the telcos and vendors wrote to the DoT, telling that the 3GPP and 5Gi standards were “non-interoperable”. Later, in November, COAI had written to TRAI to make the local standard a part of the global standard. In the letter, COAI DG had said, “chipsets for 5Gi are yet to be developed and even if vendors agree to develop those, it will take one to three years to develop them, and that too at a very high cost as these will be used only in India given that the standard is not globally harmonized, hence not accepted by any other country”.

Talking about the issues that might cause, he added, “this may put the consumer at a burden if sufficient options are not available for device procurement as the operators will also have to undergo additional constraints in validating technologies that are uncommon”. Lt. Gen. Kochhar also added that since no devices run the 5Gi standards, telcos can’t conduct tests for the same.

On its part, the TSDSI has refuted the telcos’ claims. Bhaskar Ramamurthi, Director, IIT Madras, and former chairperson, TSDSI, said, “5G handsets require only minor firmware and software changes to become 5G+5Gi handsets, which will not lead to an increase in costs as confirmed by some handset solution providers and operators”. He further added, “given the scale of the Indian market in terms of the number of (mobile) connections and growth rate, the initial development cost of making these modifications is modest as it will get amortized very quickly”.

The telcos also argue that the global standards will allow economies of scale, bringing down gear costs. 5Gi won’t allow for the same and hence increase 5G prices.

#### **How the Merger Sorts Out Problems with 5Gi**

The local standard has been one of the government’s initiatives towards “AtmaNirbhar Bharat”. With a local standard, India’s 5G network will become a unique 5G experience for the people. However, since its acceptance by 3GPP in November 2020, 5Gi has seen great opposition from the industry.

The TSDSI has claimed that 5Gi will have better range than normal 5G networks, but that’s it. So far, TSDSI has provided no other incentives of installing 5Gi across the network in India.

The merger solves two of the most critical issues with 5Gi; it removes the non-interoperability, and the technology fragmentation. With a merged, hybrid network standard, 5Gi becomes compatible with 3GPP, and therefore, it solves the other problems that might have risen from the implementation. Since the telcos argued telecom gear becomes more expensive with 5Gi, a successful merger brings economies of scale back to the equation.

An India-specific 5G standard seems like the next logical step and there are obvious incentives in this situation. Countries with similar conditions to India’s might also see benefit in a big cell size standard. 5Gi supports key technology such as NB-IoT and URLLC; both of them are crucial for the IoT industry in the country. The nation’s 5G network requires a solid foundation in a carefully-chosen standard. Government’s push for 5Gi might seem a good move, however, cutting off India’s network from the global network will not only make 5G expensive, it will also put off almost everyone to work on it. 🙄

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# 5G Rollout by August 2022: Lt. Gen. (Retd.) Dr. SP Kochhar, DG, COAI

Talking at the DQDeepTech 2021, Lt. Gen. (Retd.) Dr. SP Kochhar, the Director-General at Cellular Operators Association of India, shed some light on the 5G rollout, and the work ongoing on the same. The COAI DG said that if the government solves all the issues the industry has, India will see a 5G rollout by mid-August 2022



Lt. Gen. (Retd.) Dr. SP Kochhar

BY HEMANT KASHYAP

## The Issues with 5G Rollout

Talking about the problems the industry faces right now with the 5G rollout, Dr. Kochhar highlighted the spectrum pricing. He insisted that without an affordable spectrum, rolling out 5G will become tough. “The cost of the spectrum has been rather high, and if the same trend continues, the takers for the 5G spectrum will be quite a few. In 4G there was readymade ROI, in 5G we are still grappling with use cases. If the government doesn’t miss the wood from the trees, they will realize that the cumulative revenue that they can get from telcos will be much higher than they can get from the spectrum”, he said.

Talking about the government’s efforts, he said, “the government is doing a lot of work in identifying, rationalizing, and cleaning up spectrum bands. After that happens, we will get enough spectrum to roll out 5G.

Spectrum has to be both access as well as backhaul. What we have been asking is that both the spectrum should come as a bundle. Anyone who gets access spectrum should be allocated a backhaul spectrum of sufficient quantity”.

Last month, COAI had written to the government a week ago regarding the 5G spectrum prices. COAI had said that 5G auctions won’t succeed unless the government does not drop spectrum prices by 60-70%. As such, the industry body has consistently been pushing the government to rationalize 5G airwaves pricing.

## The Fiberization Problem

Dr. Kochhar also highlighted one of the more critical issues, the densification of fiber. “There will be some instances we won’t be able to lay fiber cables. So we will need E-band, also known as fiber-in-the-air. This will help in difficult terrain – in cities where digging is impossible,

5G will be adequately employed if there are an adequate amount of use cases in M2M communication. In India, Industry 4.0 is coming up, and 5G will be useful. 5G will also enable high-speed communication.

and in sparsely populated areas where laying fiber is not viable”, he noted.

The COAI DG further said, “only about 30% of towers are connected with fiber. With 5G it will become more critical. Hence the connectivity of towers with fiber is essential”.

He expressed that while both the TSPs and the Government are keen to lay fiber, there are issues and the government and TSPs are at it. Dr. Kochhar further noted the exorbitant, inconsistent charges local bodies charge while laying fiber; he said that charges varied from Rs. 10,000/meter to Rs. 1 crore/meter. As such, pointing to the urgent need to increase connecting towers with fiber to the base stations, he said, “hopefully, the local bodies see sense in this and will stop charging high rates”.

Dr. Kochhar, though, expressed hope that the government and the telcos can achieve a healthy fiberization and densification soon.

Lastly, he talked about small cells, and the need to provide proper coverage in urban areas. “In urban areas, small cells have to come up. It is not only getting spectrum but also populating the area with an adequate amount of small cells to meet the capacity demands”, Dr. Kochhar said.

### What Will Work for 5G in India?

Dr. Kochhar said that in order for 5G to work, telcos have to focus on the enterprise. He added that the individual users will not feel the need of higher speed with the current usage. “I’ll be very candid on this. We don’t really have a need for 5G for our personal use. With the speeds that we get with 4G, with proper densification and fiberization, we won’t need 5G. This will be the first time machine will be talking with machines. For us, low latencies don’t matter, but for machines, it does. Industry automation and Industry 4.0 will be big in the future”, he said.

Further, Dr. Kochhar added, “5G will be adequately employed if there are an adequate amount of use cases in M2M communication. In India, Industry 4.0 is coming up, and 5G will be useful. 5G will also enable high-speed communication”. He cited an example where 4G would not keep up, but 5G will. “For example, if you are traveling

in a bullet train or an airplane, 4G won’t be able to give connectivity, while 5G will”.

He also said that in the beginning, telcos should roll 5G out “riding” on 4G; or 5G NSA. “The applications across the world may not suit India. In rural areas, 5G will ride over existing 4G networks, in an NSA arrangement. In the ongoing 5G trials, the TSPs have shown coverage of over 20 km, which was thought to be impossible in theory. It is an opportunity to aggregate the number of subscribers in villages. People will have a choice to use either 4G or 5G. In industrial areas, there will be a requirement of low latencies and high capacities. First, the NSA 5G will do the job, but later, the need for 5G SA might arise”, Dr. Kochhar said.

“We will see a heterogeneous 5G deployment”, he added.

### 5G in August 2022?

Recently, media reports had noted that the government has reached out to telcos to launch 5G networks in a few key cities by as early as Independence Day, 2022. On that discussion, Dr. Kochhar had all but confirmed some semblance of a deadline was present.

“The variables have to be addressed and optimized before saying when 5G will come out. I think, if the variables are sorted out, we will be able to roll out 5G by August. If they don’t, it will take more time. But we have emphasized to the government to address the issues, and they are being addressed quickly. If they get sorted, by mid-August, we will roll out 5G”, he said.

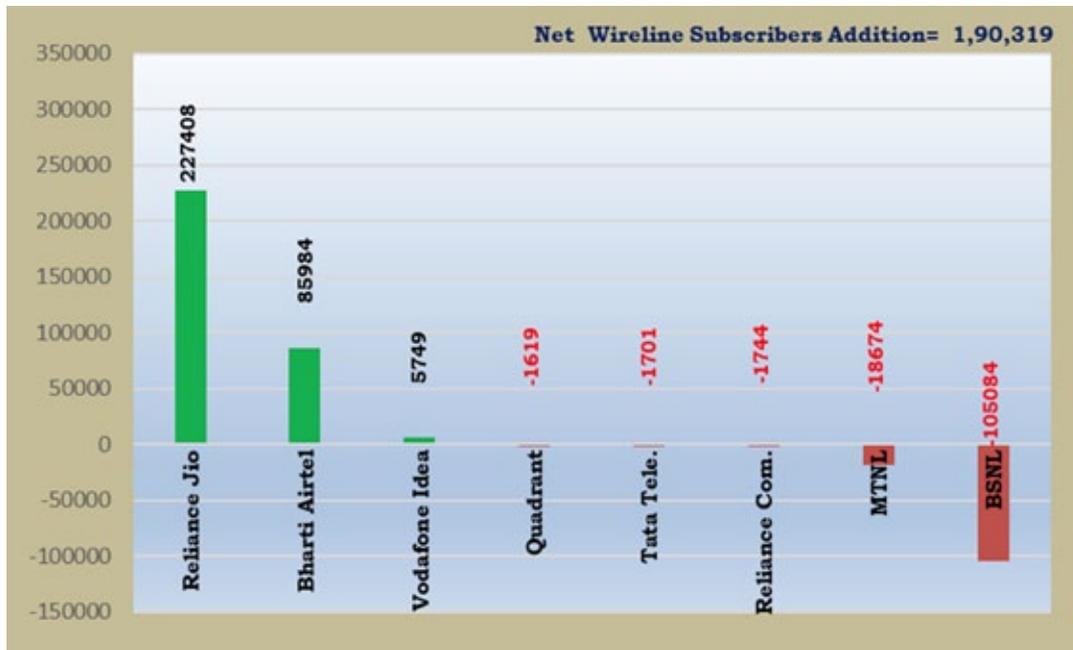
The general public sentiment in India has been ambivalent towards 5G. Many have questioned the need for a network upgrade when we had one half a decade ago. What’s more, India’s connectivity issues make it seem that a 5G rollout will only paper over the cracks. However, 5G’s potential makes it an important exercise for the government to facilitate rollout.

One can only hope that the government will sort the issues Dr. Kochhar highlighted at DQ DeepTech, and we can see 5G as soon as August next year. 🙏

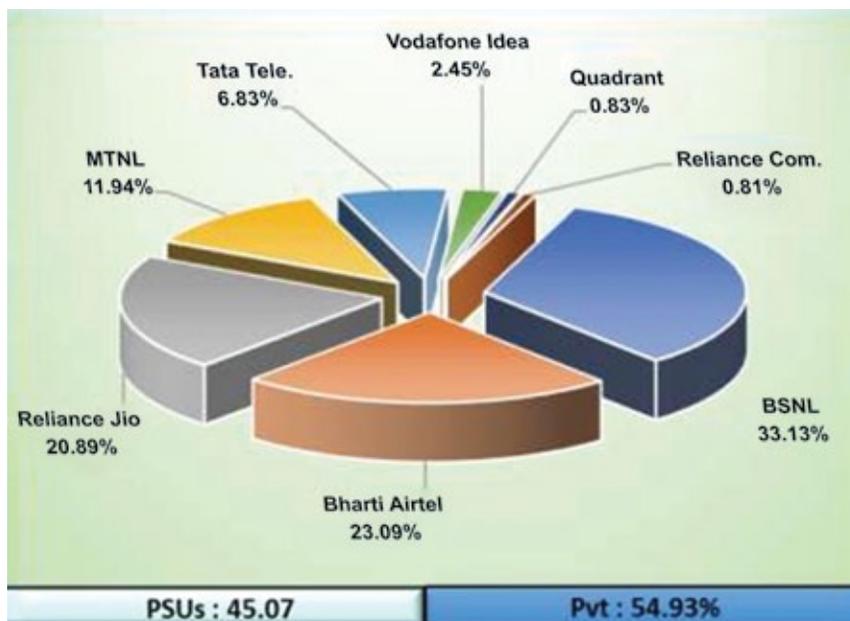
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# TRAI Subscriber Data

Net Addition/Decline in Wireline Subscribers during the month of October, 2021



Market Share of Wireline Subscribers as on 31st October, 2021



Total wireless subscribers increased from 1,166.02 million at the end of September-21 to 1,166.30 million at the end of October-21, thereby registering a monthly growth rate of 0.02%. Wireless subscription in urban areas decreased from 637.89 million at the end of September-21 to 637.44 million at the end of October-21, however wireless subscription in rural areas increased from 528.13 million to 528.86 million during the same period.

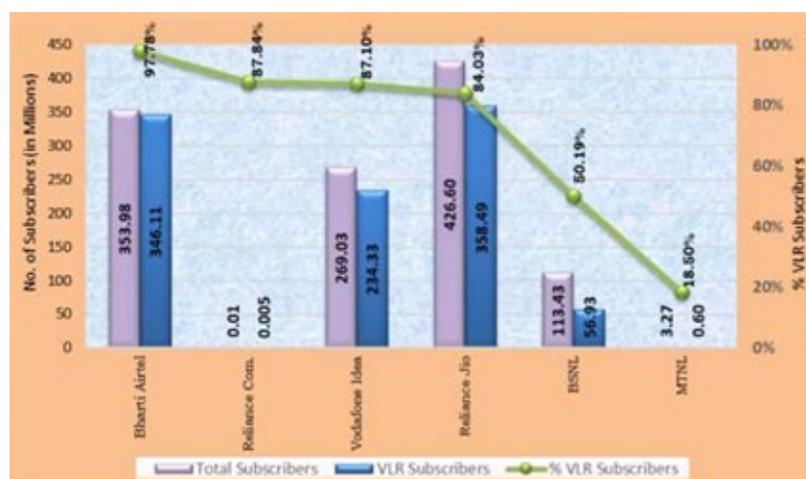
## WIRELESS

### Access Service Provider-wise Monthly Growth Rate of Wireless Subscribers in the month of October, 2021



## VLR

Bharti Airtel has the maximum proportion (97.78%) of its active wireless subscribers (VLR) as against its total wireless subscribers (HLR) on the date of peak VLR in the month of October-21 and MTNL has the minimum proportion of VLR (18.50%) of its HLR during the same period.



Out of the total wireless subscribers (1,166.30 million), 996.47 million wireless subscribers were active on the date of peak VLR in the month of October-21. The proportion of active wireless subscribers was approximately 85.44% of the total wireless subscriber base.

# Social Media and Public Good – Can a Synergy Develop?

Facebook's products harm children, stoke division and weaken our democracy. The company's leadership knows how to make Facebook and Instagram safer but won't make the necessary changes because they have put their astronomical profits before people. – Frances Haugen

BY HEMANT KASHYAP



In September, The Wall Street Journal published shocking revelations about Facebook and Instagram, following Frances Haugen's whistleblowing on the Silicon Valley giant. By and large, the documents reveal that Facebook had the knowledge and the means to stop things that happen on a horrifyingly fast frequency, yet chose to prioritize its profits over the good of the users, as Haugen puts it.

Some of the aforementioned phenomenon, in brief, include enabling spread of hate and aggravating it, the adverse impact of the platform on the mental health of teenagers, a weak response to the threat of human traffickers and drug cartels, anti-vaccination campaigns... the list goes on.

These revelations come in the aftermath of Mark Zuckerberg testified to Congress that Facebook spends billions to remove harmful content. However, if the company was, in fact, spending billions, the impact of those billions has not been felt.

Facebook's fall from grace has raised questions on the role of social media in our lives, and what the future holds. During the times when people are using more internet than ever, and hence more social media than ever, how can we hold these untouchable, faceless social media giants responsible for the people that spend hours using their services. And with Facebook changing to Meta, and moving towards a more immersive experience than ever, should it be working to draw people in deeper, or work to clean up its act?

### The Underlying Problem

In the thousands of documents leaked by Haugen, there is a lot to unpack. While the company has worked to remove the questionable content, the efforts have been failing, and hence, people within the company have felt the need to reevaluate the algorithms that dictated what content showed on a user's Feed and where. Worryingly, this algorithm can be easily overruled by the algorithm that works with promoted content to maximize engagements.

This is an expensive process, as Facebook would have to sink resources in rewriting the entire code of

the algorithms to redefine priorities each of them take, and incorporating a method to weed out content that might be objectionable. Therefore, this comes down to the decision of whether to prioritize profits or to check the safety of people. The popular perception here is that Facebook prioritized the profits, which has been reflected in its latest results – it managed to earn over \$9 billion in profits even after the whistleblowing incident.

However, things are not as black and white as just that. Haugen herself has come out and said that it is in Facebook's financial interests to keep people safe on its apps. "Contrary to what was discussed at the hearing, we've always had the commercial incentive to remove harmful content from our sites", she said. Haugen also pointed out that Facebook has invested \$13 billion and about 40,000 people to remove harmful content.

### So, what is the problem here?

One of the most alarming revelations that came along with many others was that Mark Zuckerberg directly intervened with the working of the Civic Integrity Team, the internal team that is responsible for flagging and removing content, and making Facebook's apps a safer place. The documents revealed that while the team had ideas to implement which would make these social media channels safer, they were overruled, sometimes directly by Zuckerberg himself.

Facebook introduced the world to the phenomenon of virality, as one of the documents from the team reads, dated December 2019. The team had also pointed out that it has "compelling evidence that our core product mechanics, such as virality, recommendations, and optimizing for engagement, are a significant part of why these types of speech flourish on the platform".

Interestingly, till 2009, Facebook's News Feed was just a collection of posts, arranged chronologically with the latest posts at the top. However, as the company grew larger, attracted more companies that paid for ads, and money started flowing in, the company introduced algorithms that were used to push posts more relevant to the users, and keeping them in line with the interests of the advertisers while also bringing users back. However, this has seen the News Feed become an "arms race", with

Contrary to what was discussed at the hearing, we've always had the commercial incentive to remove harmful content from our sites.

Facebook should not get a free pass on choices it makes to prioritize growth and virality and reactivity over public safety. They shouldn't get a free pass on that because they're paying for their profits right now with our safety.

more and more damaging content making it to the top of people's Feeds around the world.

A year later, the company's Public Policy team also was cited in a report stating that it "commonly veto launches which have significant negative impacts on politically sensitive actors". This means that Facebook has a lot of control on its algorithm. How much control? According to Haugen's testimony before Congress, it has all of it.

"They have a hundred percent control over their algorithms," Haugen told Congress. "Facebook should not get a free pass on choices it makes to prioritize growth and virality and reactivity over public safety. They shouldn't get a free pass on that because they're paying for their profits right now with our safety."

In short, the problem lies in Facebook's unwillingness to change its algorithm too drastically. While that would definitely make Facebook and Instagram safer, however, it might tip the scales away from profitability.

### Facebook Needs to Clean Up its Act

As this has shown, the company cannot keep this up; the headwinds it is facing and the negative public image it has now forced it to change its name to Meta, to differentiate the rest of its business from the belligerent social media channel. In keeping the current status quo up, it might end up losing a large share of its users, as more and more of them move away from Facebook.

In another leaked document, Apple was cited to have threatened to pull Facebook and Instagram from iOS on October 23, 2019, over Facebook's alleged inaction over human trafficking content after a BBC News Arabic report found that domestic workers were being sold on Instagram and other apps. In the face of such an existential threat, the company removed over 1,29,000 pieces of content, and even ditched a policy exception letting established brick and mortar businesses like recruitment agencies post ads about domestic workers.

Apple might have dropped its threat, closing the incident within a week, but Facebook needs to realize that the Haugen Whistleblowing scandal has brought it to the edge of an ostracizing on a much larger scale.

These continued incidents, and Facebook's inaction, speaks volumes about the priorities of the tech giants, and hence, the company has found itself at the center of all the negative attention for the last 3 months. The extent to which Meta goes to ensure that its ad revenues stay up is reflected neatly by the fact that it never went through with the plan of hiding the likes on posts across Facebook and Instagram. When the company realized that it hurt ad revenues, it pulled the plug on the plan. However, after much opposition, Instagram finally allowed users to opt into hiding their likes.

Along with this, Facebook's flagging system has seen banned content go through easily, and the company has failed to rectify a simple design flaw in the monitoring system, also called Laser in the leaked reports. The system was only trained to filter out groups or pages that posted obviously political content over the last few days or so. Therefore, such groups could easily avoid being banned, and thus, people kept getting recommendations of such groups and content, meaning that Laser had a very high churn rate.

All of these silly mistakes have seen Facebook's reliability, which was already on a very low level, tank even further. With the company's vision of a more immersive social media experience with a Metaverse, it needs to clean up fast, before it finds itself in an irrevocable position.

### Final Thoughts

On January 28, 1986, an O-Ring failure led to the explosion of space shuttle Challenger, just 72 seconds after lift-off, killing all 7 aboard. Later, Tom Brokaw would say of the accident, "the American public would be demanding some difficult answers, and of course, we'll all have to examine what it is that we want from this era of high technology".

Almost 40 years on, those words still ring true. Facebook's fall from grace has raised questions about if we can ever say "social media" and "public good" in a synergic sense, and has cast shadows on the impact of technology on our lives. 🙏

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# TRAI Directives

**T**RAI issued a directive on 7th December 2021 to all mobile operators with instructions to ensure that Port Out requests from customers were not delayed / denied by not providing facility to send SMS to the appropriate port out short code in the prepaid packages. TRAI has directed that all prepaid packages should have the provision of sending port out requests.

Subscribers who wish to port out their number to another network can do this by sending an SMS request for a Unique Porting Code (UPC) to 1900.

Customers can then forward this code to the Number Portability Zone for changing their service provider retaining the same number.

However, Vodafone India (vi) has now appealed against this directive of TRAI. Vi has approached the Telecom Disputes Settlement Appellate Tribunal (TDSAT) through a petition and says that TRAI does not have the power to issue a directive without first consulting the industry.

This petition is now scheduled to be heard on 22nd February 2022.



# Amendment to License 21<sup>st</sup> Dec. 2021

**A** amendment dated 21st Dec. 2021, in Unified Access Service (UAS) License Agreement for change in time period of storage of Call Detail Record / Exchange Detail Record / IP Detail Record.

The Government has directed all Telecom / mobile and Internet service providers to keep call & internet data records for two years, instead of the current one year required by their Licenses.

Login details of services such as internet access and mail will now have to be maintained for two years. Records of calls made through mobile applications will also have to be maintained for two years.

This is available on the DoT Website.

# Amendment to License 25<sup>th</sup> November-December 2021

**I**n an earlier Amendment dated 25th November-December 2021, in the Unified Access Services License, the government had further modified the definition of Gross Revenues which had been a thorn in the flesh for operators for long.

An extra clause (19.1A) titled Applicable Gross Revenue (ApGR) had removed the Non-Telecom Revenues like:

- Revenues from operations other than Telecom Activities
- Revenue from activities under a license from the Ministry of Information and Broadcasting
- Receipts from USO fund
- Income from Dividend
- Income from Interest
- Capital Gains from sale of fixed assets
- Gains from Foreign Exchange rates
- Income from Property
- Insurance claims
- Bad Debt recovered
- Etc.

The Amendments is available on the DoT Website.



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